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car action

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52mph super-monster

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'SHACK ATTACK!
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11 pages!

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FEBRUARY 2004

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VOLUME 19 ■ NUMBER 2 ■ FEBRUARY 2004

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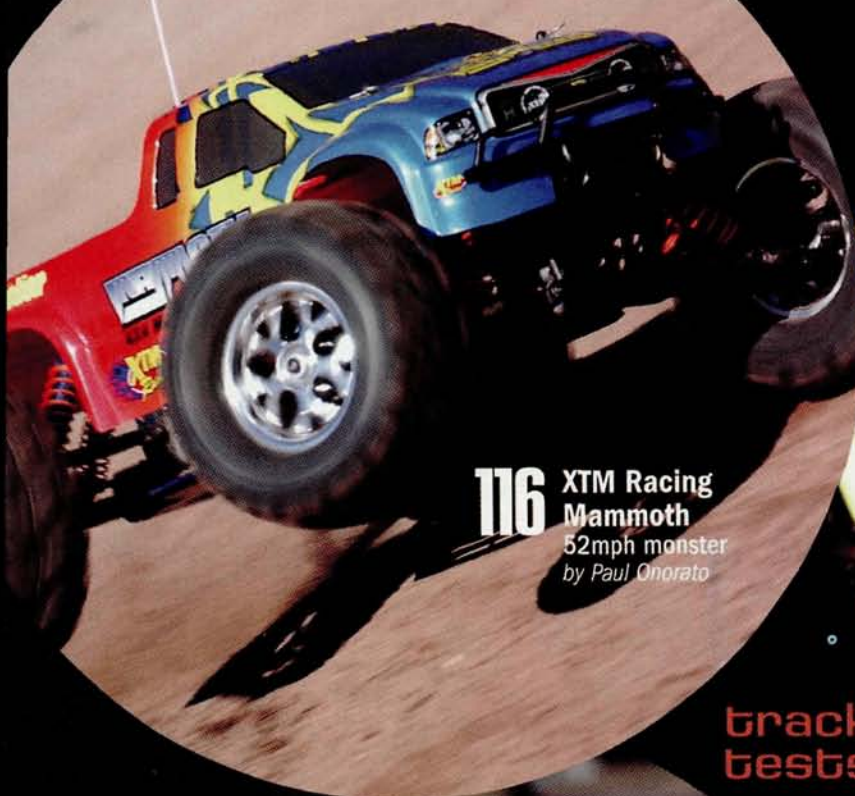
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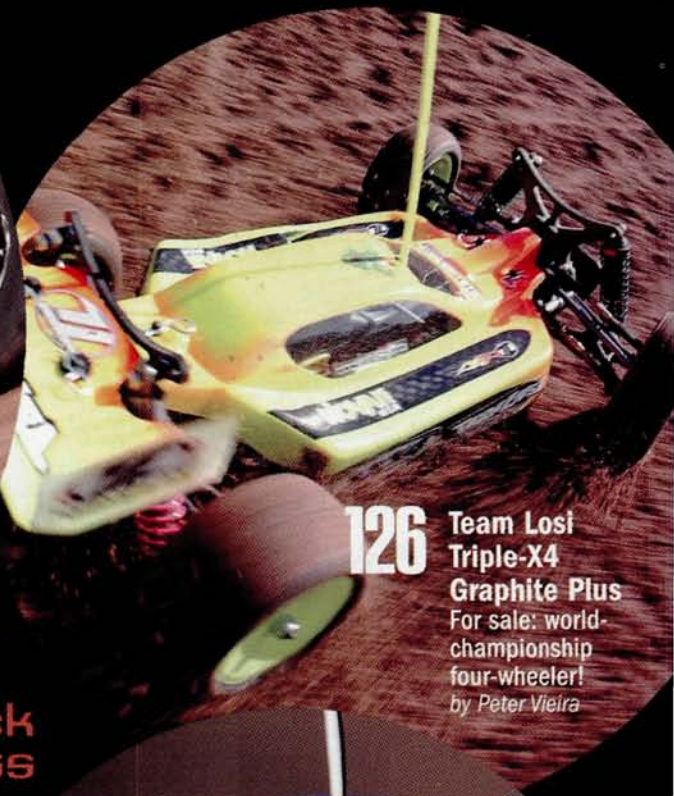
COVER STARS:

(from top) Team Losi's Mini-T, sure to be a big (yet small) thing for 2004; the physics-defying 52mph XTM Racing Mammoth takes center stage; and a very lucky Airtronics MS strikes a pose. All pics by Pete "Hippies Smell" Hall.

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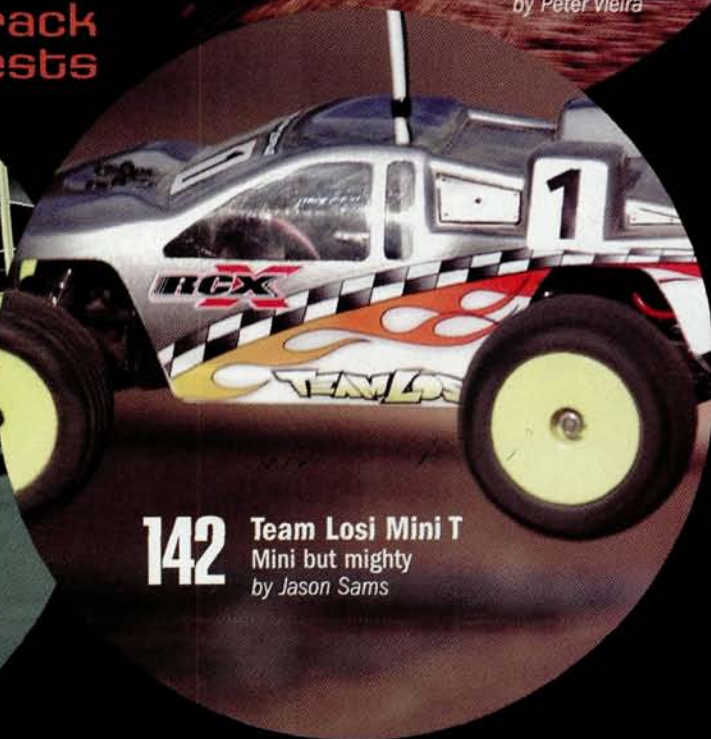


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starting line

Minis are back (again)!

To be fair, minicars and micro-cars never left. But they're back in the spotlight in a major way thanks to the Team Losi Mini-T (reviewed in this issue), the first truly off-roadable, full-function RC car in 1/18 scale. Before we get into the significance of the Mini-T, let's give some credit where it's due. Kyosho was the first to pack "big" RC features into a micro machine way back in the '80s when it released the "Garden Series" 1/24 cars, which included a tiny Ultima buggy complete with independent suspension and gear differential. And Kyosho is still a micro-off-road innovator with the Mini-Z Overland series, which brings rally-action to the 1/28-scale segment with the usual superrealism Mini-Zs are known for. Great cars, but what makes the Losi different is its larger size (which makes it inherently better for "real" off-roading) and its non-scale status. It isn't really 1/18 scale, just like a "full-size" Triple-XT isn't really 1/10 scale. The Triple-XT and Mini-T aren't models of anything and therefore have no scale. If anything, a Mini-T is a 1/2-scale Triple-XT! By simply shrinking the XT, Team Losi has delivered the ultimate off-road minicar. The question is, where does the Mini-T (and the vehicles that will inevitably be offered to compete with it) go from here?

"Racing" is the obvious answer, and why not? The Mini-T has what it takes to race, and given its low cost, many people who can't afford 1/10-scale racing (read: practically every 14-year-old kid out there) could afford to race a Mini-T. But here's the catch: we need to keep Mini-T racing affordable by NOT making it yet another class for us diehard, grown-up guys. Sure, we can have our "modified" class, but please, let's always keep an "absolutely stock" class open for the new guys. Shop owners and track operators, I'm looking at you. This is your big chance to get a whole new crew of racers into your shop and on your track. Keep the racing fun (and fair), and give 'em trophies. They'll be back every weekend!



DRAW! We have the hottest pistols in RC, all reviewed and rated for your reading pleasure. If you don't "speak" computer radio, this is your chance to become an expert—all the high-end features are explained.

NITRO IS A WINNER!

Radio Control Nitro recently won the coveted Gold Ozzie award for best cover design of a consumer magazine with circulation of less than 100,000. The winners were announced by Folio magazine at a Celebration of Excellence Awards Gala in New York City. RC Nitro senior art director Leslie Costa, who designed the winning June 2003 cover, accepted the award. She was also recognized with an honorable mention for best redesign of a magazine with circulation under 100,000. Said Costa, "To be in the company of such powerhouses as *National Geographic Traveler*, *Elle Décor* and *Road & Track* speaks volumes about the level of excellence RC Nitro has reached. We have an incredibly talented team behind the magazine."



IN THIS ISSUE

BIG SHACK ATTACK! What's this, a RadioShack ride reviewed in *RC Car Action*? Sure! The new XMODS 1/28-scale cars are highly detailed, full-function RC machines that fit right in with the high-quality "hobby grade" stuff we're all used to, and you can pick one up for about the same price as a PS2 game. Don't believe it? Check out our "First Drive" for yourself.

IFMAR OFF-ROAD ELECTRIC WORLD CHAMPIONSHIP. Not only do we have 11 big pages of action covering the most prestigious event in RC, but we also scored Billy Easton and Ryan Cavalieri's winning Associated and Losi rides for a separate "Inside the Pro's Cars" feature. Now's your chance to steal their secrets!

Until next time,

Peter Vieira
Executive Editor
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RADIO CONTROL car action

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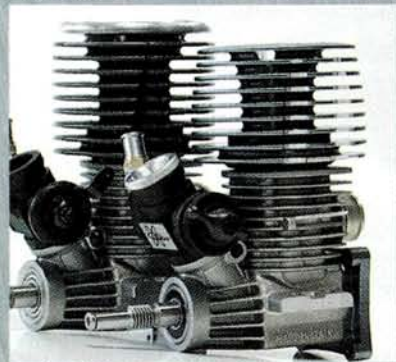
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readerswrite

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TRINITY



TNX-STATIC

I'm really psyched that Tamiya has revamped the Terra Crusher. I've already made a lot of mods to mine, like Pro-Line 40-series wheels and tires and an XTM engine, but I really want to add the one-piece TNX chassis. Will it be available separately? [email]

Jason Chang

I'm not sure if it will be offered as a Terra Crusher option part, but it will certainly be available as a replacement part for the TNX and can be retrofitted to your Terra Crusher—just like all of the new TNX parts.

—Pete

CRYSTAL METHOD

I'm confused about AM radio crystals. I was looking into the JR R125 AM receiver, and it says that it is a 27/75 receiver. I have a JR XR2 pistol radio that came with my Triple-XS RTR. As you know, it is a 27MHz radio. Can I use 75MHz AM crystals in my radio, or do I need a new radio? Thanks for your help and keep the great 'zine coming off the presses. [email]

Matt

The R125 AM receiver is offered in 27MHz and 75MHz versions; it isn't a single receiver that is compatible with both frequency bands. So, you can only use 27MHz crystals with your Triple-XS Sport.

—Pete

LUCKY KID

I was wondering when ya'll are going to review the new Nitro RS4 3 RTR Evo from HPI. I'm wanting to get a nitro car for my 5-year-old son. He already has 3 electric cars and hates to wait for batteries. He drives my RS4 3 SS, and I was wanting to find out if the Evo would be a good first nitro car for him. [email]

Joel Dutton
Las Vegas, NV

WRITE TO US! Send snail mail to "Letters," Air Age Inc., RC Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA, or email readerswrite@airage.com. Please include your full name and address. Sorry, we can't reply to all letters.

Sounds like a plan to me, Joel. Since the Evo is an RTR, it can be ready for action before your carpet monkey's patience wears thin. You can fire it up with a drill instead of tugging at a pull-starter thanks to the Evo's Roto Start T-15 engine, and it should definitely keep up with your SS. But the little dude is only 5, does he need that much car? Or is it really for Dad? Do I care? No! Go have fun with your little dude. He's a lucky kid!

—Pete

MO' MINIS!

I saw your December issue with the XRAY T1 Mini and the Yokomo MR-4TC Mini, and I love these sweet little rides! They look great, but I have some questions. Will there be a cheaper version of the XRAY (like the T1 Mini Raycer)? Will the body and wheels that you put on the prototype XRAY fit the Yokomo? What about the bodies listed in the "First Look" article of on the XRAY? Will they fit the Yokomo? What about the batteries? I saw that they were 4-cell. Can I get a stick pack, or do I have to get a matched pack? Are there cheaper cars out there? [email]

Joe



That's a lotta questions, Joe! Let's see, XRAY T1 Raycer Mini ... if XRAY sells a bunch of T1 Minis, a plastic-chassis "Raycer" would make sense. Tire and wheel compatibility ... yes, both cars use 12mm hexes and accept standard touring car wheels and tires. The bodies should also be universal, and the shorty 4-cell stick packs offered for Bolink Legends racing could probably be made to fit both the XRAY and Yoke, but side-by-side cells will be a better fit. If you want a more affordable mini, check out Tamiya's M-chassis lineup; the Alfa Romeo Giulia Sprint GTA is the latest.

—Pete

SSSSSSMOKIN'

This is in reply to a letter published the December 2003 issue of *RC Car Action*. A reader, Tim Furlong, wrote about making a car smoke its tires. Pete replied that he didn't think RC tires could actually produce the fluffy white stuff.



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Well, a friend of mine had a Lehner Brushless motor in his TC3, and he showed me pictures of his tires SMOKING. That's when I knew I had to go brushless. I bought a Hacker B50 8s a few months ago and have been breaking axles ever since. I had an old pair of junk tires and wanted to see what it'd look like up close. So, I threw a 16-cell pack on it, parked it against a wall and gave it some throttle. It burnt and ripped the tires apart and even DUG holes in my blacktop driveway! And boy was there ever smoke—I was practically choking on it. I know you probably still don't believe me, so I'll just send you to my website, so you can see the pictures and video for yourself. My site is <http://www.dualbl.com>. Just click TC3 along the top, and scroll down. If you'd like to put that in *RC Car Action's* video section, feel free, but remember to give credit where credit is due. I'm a bit surprised that Pete answered the way he did, as I've posted the video on *RC Car Action's* message board twice before. Anyway, let me know what you think. [email]

Nick Sweo

Well Nick, I know Pete pretty well, and he thinks he needs to make more time to get on the RC Zone bulletin board! OK everybody, hit Nick's site; he ain't lying—his TC3 can really light 'em up!

—Pete

SAVE THOSE PENNIES

OK, we're hooked ... my two sons (ages 8 1/2 and 11) and I are really enthusiastic about

RC cars and hope to get more involved. Both of my sons have decided that they each eventually want a 1/10-scale touring electric car because the nearby track allows only electrics. It will be some time until they can afford one, so my question is this: what related items would you suggest that they ask for as Christmas presents, stocking stuffers, etc. that are inexpensive and useful for their hobby? Getting kids involved is the future of this great hobby, and I know gradually obtaining items would keep their interest piqued and make them feel as if they are participating. I imagine you have had articles in the past on this subject, but as we're new to the hobby, we don't have any older issues. [email]

Mark C.

I suppose they could get motors or batteries, but that would just seem like torture to me. It would be like giving them a pair of handgrips to get them excited about someday having a minibike! Here's what I'd do: give each a coffee can and have them decorate the cans with pictures of the cars they like. Cut a slot in the lid and presto—an instant RC dream bank. Put \$5 in each can to get them started and get a subscription to *RC Car Action* to keep them psyched. Then watch them work like dogs for bonus allowance dollars!

—Pete

YOU SAID IT

sponsored by **TRINITY**

Why aren't there ready-to-run pan cars?

I'm an oval racer (have been for many years), and I was curious why none of the major car makers offer an oval RTR package. I live in Greenville, SC, and we have a great oval track that attracts 40 to 60 drivers every Saturday.

We race many classes; all pan-car chassis and Bolink Legends chassis are welcome there. My question is, why aren't there ready-to-run pan cars? It seems they could be easily developed and priced comparably to the RTR cars offered today. [email]

James

I think it's just a matter of numbers. Given the total size of the pan-car scene compared to touring cars and off-road vehicles, the number of guys within the already small oval niche who are wishing for an RTR probably isn't enough to justify the expense of producing and marketing an RTR. But that doesn't mean an oval-racing shop like yours in Greenville couldn't build up kit cars and offer them fully prepped and ready to race, so there's one less hurdle for potential new racers. You could even have all the "RTR" guys run in one class.

—Pete ■



Each month, "Readers Write" sponsor Team Trinity awards the "You said it" letter writer the Reference body of his choice. This is the Killer B, for the Associated B4.



Got a hot scoop? Send it to johnh@airage.com!

BY JOHN HOWELL

insidescoop

THE LATEST STUFF • SPY SHOTS • INSIDER INFO

Tamiya Rockbuster Little Gear TLT-1



Tamiya has a new microsize monster truck! The TLT-1 is the first in Tamiya's new 1/18-scale Little Gear Series. The truck sports a ton of cool features; it's powered by a 540-type motor, uses specially designed wheels and tires, has a lightweight aluminum chassis, a belt-drive 4WD system, four-wheel steering capability (2 servos are required), and the suspension consists of four-link push rods with four aluminum dampers. The truck's overall length is approximately 280mm, and it's topped off with a lightweight, durable polycarbonate body. The truck requires a Tamiya TLT-1 battery pack and an electronic speed control. Tamiya America Inc. (800) 826-4922; tamiyausa.com.



EXCLUSIVE!

MINI MONSTER!

PICCO XP .12R

Picco's newest 3-port XP .12R is ROAR legal and a powerhouse! Noteworthy features include: an all-new fluted, SG crankshaft; a slide carb; a finned engine case and new sleeve design (featuring new transfer/boost ports); and an oversize cooling head. A redesigned carburetor venturi, mixture needles and a new alloy body allow easy and stable engine tuning, and Picco claims that the engine pumps out a whopping 1.45hp at 37,000 rpm.

RACE-READY WERKS

PICCO P2 M .21

Looking for something bigger? The Picco "Medium Block" .21 allows T-Maxx owners to bolt in big-block power without a conversion kit; the engine drops right in, thanks to its specially designed case and included engine mounts. We goofed last month on Picco's distributor info. The correct distributor is Werks Racing. Contact Werks for more information on Picco engines, Kawahara hop-ups, Enneti tires, and more. Werks Racing (408) 365-1000; werksracing.com.



Get Ready to Race



Team Associated T4 RTR



Team Associated's RTR T4 is basically the same as the Team Edition T4, but it has dogbones instead of universal axles and a set of blue-anodized-aluminum shocks instead of the hard-coated Team shocks. The RTR version will come with a 17-turn Reedy mod motor, an Airtronics Blazer sport radio system and 94102 servo, an LRP Runner reversing ESC, a screen-printed and trimmed T4 truck body, medium-compound lugged rear and ribbed front tires with foam inserts; the T4 RTR also comes with a complete assembly manual and startup guide.

Team Associated
(714) 850-9342;
teamassociated.com; rc10.com.

Ballistic Binaries



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Epic Motorsports Binary 2 stock motor has a quad magnet design. The quad magnet boosts rpm by effectively increasing the timing without moving the endbell, and an epoxy balanced arm keeps more material on the armature for more efficiency and power. The motor comes in two versions: standard (straight from the factory) and Pro (tweaked on Epic's in-house dyno for maximum performance).

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(732) 635-1600; teamtrinity.com.



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NOVAROSSİ

MINI-T MODS

Trinity Team Losi Mini-T power-ups

Trinity now offers performance upgrades for the Team Losi Mini-T. Thanks to this new Monster Micro Motor and 5- and 6-cell Micro Zip Pack, Trinity is turning the short-stack stadium truck into a powerhouse pickup. The Micro Motor is a direct replacement for the stock Mini-T motor and features improved performance over the stocker as well as changeable brushes. The 5- and 6-cell Micro Zip Packs increase your runtime and power dramatically, according to Trinity, and each comes with the proper plug installed.

Trinity Products Inc. (732) 635-1600; teamtrinity.com.



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Metal Minis

Testor corp. 1/32-scale Mini Cooper and Audi TT

Testor's new 1/32 Mini Cooper and Audi TT feature a unique twist: they have metal bodies, whereas most other minis on the market come with plastic shells. What's cool about these cars is that they feel more "scale" than anything else on the market. Although it looks like a scale model, the Testor kit goes together very simply with a screwdriver (no need to solder wires, paint the body, or glue pieces together). Just assemble the pre-painted model with a screwdriver; add 2 AA batteries for the car and 1, 9V battery for the transmitter, and you're ready to go!

Testor Corp. (815) 962-6654; testors.com.

"K"OMPETITION Ready

Kyosho Kanai Edition III competition 1/8-scale buggy

Kyosho appears ready to release a new 1/8 off-road racing machine: the Kanai Edition III. Rumor has it that this will be the most feature-filled K buggy to date. Here is a quick pic for you to look at, but next month we'll have some finalized details for you!



Kyosho; distributed by Hobbico/Great Planes Model Distributors (217) 398-8970; kyosho.com.

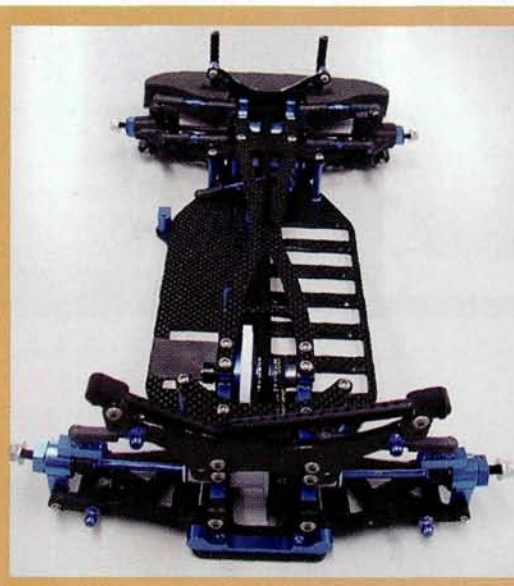


1/12-SCALE TOURER

corally mini Assassin

The 1/12-scale mini Assassin has only seven parts that differ from the full-size 1/10-scale Assassin. A conversion kit for all seven parts includes shorter wishbones (4), a new upper deck, a main chassis plate and a motor bulkhead, so you can easily convert your Assassin to a 1/12-scale Mini Assassin.

Corally USA; distributed by Specialized RC Intl. (407) 681-5905; corallyusa.com.



Tamiya 415 Touring car

World champ and team driver Surikarn Chaidejsuriya debuted Tamiya's new 415 touring car at the Reedy Race Asia in Bangkok, Thailand. Some fast facts about the car: it features a completely redesigned twin-belt drive-train layout that places rotating and heavy parts as low as possible for high grip; a beefy, 3mm-thick carbon-fiber lower deck is standard; the trimmed-out chassis allows lower placement of the motor, which results in a lower center of gravity. The car is also equipped with a one-piece motor mount and bulkhead for improved motor cooling. And, the 415 features modified front-suspension geometry for more effective cornering. Tamiya America Inc. (800) 826-4922; tamiyausa.com.



MINI LIDS Team Losi clear Mini-T bodies

Without a doubt, the new Team Losi Mini-T is one of the coolest trucks to hit the scene in years. The RTR kit comes in three color schemes: red, silver and blue. But, what if you want to paint a body to match your 1/10-scale Losi truck? Look no further; Team Losi recently released clear Lexan bodies for the mini racer. So what are you waiting for? Grab a body and start paintin'!

Team Losi; distributed by Horizon Hobby Inc. (800) 338-4639; teamlosi.com; horizonhobby.com.



Our Japanese correspondent, Erick Vietinghoff, recently returned from the All Japan Playmodel and Radio Control Hobby Show in Tokyo. Here's his report!



ROSHIMA RC VANNING

Inspired by a growing subculture of young Japanese van enthusiasts, this 1/12th-scale RTR kit is a very realistic replica of its full-scale counterpart. The graphics and artwork feature the latest female J-pop icon, and the rear hatch opens via radio control to reveal speakers that pump out a selection of tunes. As the speakers blast, the lights encircling them flash a rainbow of colors—while the van shakes violently from the reverberating "bass" emitted from the speakers.

DOYUSHA HEAVY EQUIPMENT

Landscaping your miniature Japanese rock garden just got easier thanks to Doyusha's new 1/12-scale RC "Crawler Crane" and "Power Shovel." Both kits come fully assembled, painted and trimmed. You, as the lead foreman, will be able to maneuver your heavy equipment using the 5-channel radio that activates the models' multiple operating functions. Earthmoving power is supplied via the included 7.2V Ni-Cd battery and charger. Artificial rock starter set included!



KYOSHO @12

Kyosho's 1/12-scale Readysset 2WD RC cars include the Vodafone AMG Mercedes CLK-DTM and the AMG

Mercedes CLK-DTM. Both models will be available in RTR "Sports" and "Racing" editions. In addition to their beautifully appointed bodies, you can expect included features such as a FM 27MHz BET band radio, a high-frequency FET (4) ESC w/reverse and brake, a receiver integrated with the digital servo and a high-power RK370 motor. Don't worry about running short on time, though; the @12 models are capable of 30-minute runs using 8 fully charged NiMH AA batteries.

ALEX RACING BARRACUDA R3

Alex Racing's R2 follow-up includes a center drive shaft and motor mount under the upper deck and rack-type steering. The R3's unique front and rear stabilizer layout should also improve traction. Passing directly through the center of the bulkheads and connecting to the chassis, the stabilizer bars are designed to provide response within 1mm of stroke action. Using its own special composite materials, Alex Racing designed and developed stronger and lighter carbon-fiber upper and lower chassis plates. Each handmade plate is fashioned with an eye-catching hologram laminate finish.



This year's All Japan Playmodel and Radio Control Hobby Show found its new home at the Tokyo Big Sight. Ominously towering above the skyline, Tokyo Big Sight's main entrance is a behemoth and exemplary of the high-tech structures peppering the metropolitan Tokyo landscape.



TAMIYA 1/12 RC

Tamiya's new 1/12-scale electric RTR models are fully assembled, painted and detailed, and they include the Opel Speedster, Mercedes-Benz ML55 AMG and BMW Z8. Forward, reverse and steering functions are executed using the included 9V battery-powered transmitter, while 8 AA batteries provide the juice needed to run the receiver and the car.

TAMIYA EXPEC GT RADIO

Hans A. Muth, the well-known German engineering design consultant responsible for the design of the Suzuki GSX1000S Katana motorcycle and other projects at Ford Europe and BMW, worked with Tamiya to develop the Expec GT-I radio for electric RC cars and the Expec GT-II for nitro cars. The GT-I includes one steering servo and a new high-performance ESC that accepts 23-turn stock motors and higher. The GT-II comes with two servos. Both models feature dual-rate steering adjustments and throttle ATV.



TAMIYA TB-02 CHASSIS

Tamiya's TB-02 offers the TB Evolution III's shaft drive train and suspension system in a far

less expensive package. Tamiya fans can expect a full line of TB-02 hop-ups to follow, and the car can even be modified piece by piece into full Evo III trim.

KO PROPO RC ROBOTS

Mechanized mayhem was brought to the Tokyo show by the folks at KO Propo, who graciously supplied the latest in high-tech, high-performance servos to actuate the movements of the robotic figures. KO's newest 6V servo, the KRS-2346IC, is practical for use in RC scale robotics and car-racing applications. Product specs include: 180-degree PC-compatible programmable I.C.S. setting, torque rating of 20kg-cm (w/6 volts), speed rating of 0.16 sec./60 degrees (at 6 volts), double-bearing coreless motor and gold-plated connectors.





MIKE O'HALLORAN,
MESA, AZ

TRAXXAS T-MAXX

Mike's Maxx is outfitted with a set of Dynamite shocks (complete with a Progressive spring kit), front and rear aluminum bumpers, steering kit, tank protector and servo mounts. He also threw an RC Trix A-arm kit, skid-plate kit, shock towers and titanium tie rods into the mix. But Mike didn't stop there; he also added an MSJ cooling head, steel braided fuel line, Hitec steering servo and Imex Jumbo Maxx tires. Mike's CJ8 features a set of custom-made stickers from Jim at Lighting Signs, four RAM lights (including a skull whose eyes light up blue), and working headlights.

WIN A ONE-YEAR SUBSCRIPTION TO RC CAR ACTION MAGAZINE! Send a sharp, uncluttered, well-exposed color photo of your vehicle (no Polaroids) and a brief description to "Readers' Rides," RC Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA. If we publish your photo, you'll receive a free, one-year subscription to RC Car Action and will be eligible to win the "Reader's Ride of the Year Contest." Write your address and phone number on your letter and on the back of every photo you send. Send email submissions to readersrides@alr.com.

JAMES PANKEY, ESCONDIDO, CA TRAXXAS E-MAXX

James "Spankey" Pankey's Traxxas E-Maxx is modified to the hilt! His truck has been set up with titanium skidplates, OFNA tires mounted on RPM wheels and Trinity 17-turn Monster Maxx motors with 12-tooth pinions. His truck is topped off with a Traxxas Baja Blade body that James painted, and other trick little mods include the addition of a wheelie bar, custom aluminum shock spacers and hand-polished shocks.



COREY ZWEGERS, ROCHESTER HILLS, MI TEAM ASSOCIATED TC3 TEAM KIT

Corey's sweet-looking TC3 Team kit has a Trinity Monster Horsepower stock motor, a Team Associated spring kit (white up front and purple in the rear), a Futaba S3003 steering servo, a Hitec HFX-R speed control and CEN Racing gray wheels with a set of slick tires. Thirteen-year-old Corey tells us that he used to race with 3300s, but he shorted them out! Now he rolls with a set of DuraTrax 1500s and Trinity Time Warp 1900s instead. And the sweet-looking paint job—a Zwegers' original!

TIM COOK, LYONS, OR HPI NITRO RS4 MT

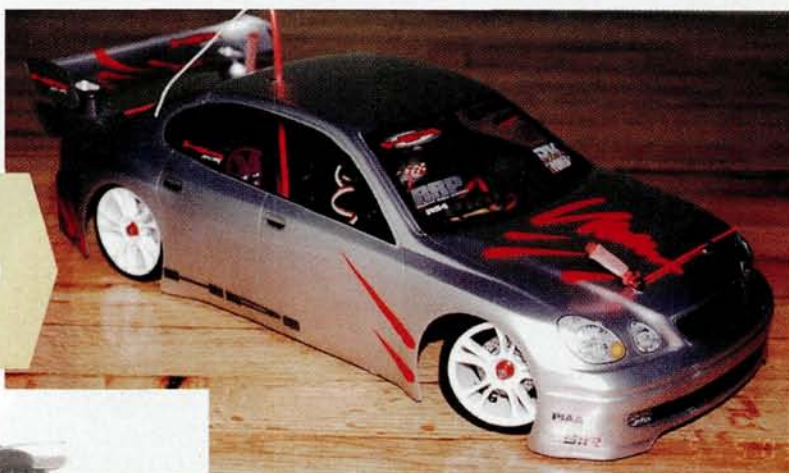
Tim's Nitro RS4 MT has a Nitro Star 15 SS engine equipped with a performance tuned pipe and air filter. While he was at it, Tim installed a Dynamite Power Plug glow plug, replaced the stock fuel lines and waterproofed the radio system. To help keep his suspension running smoothly, he added blue, firm shock springs. Tim's plans include bolting in a Traxxas TRX 2.5 engine, adding bigger tires and further beefing up the suspension system. Oh, and Tim says that he will also add "full aluminum throughout the truck."



JOSEPH PUMA, STATEN ISLAND, NY

HPI RS4 PRO

"I enjoy building the cars even more than running them," Joseph tells us. His RS4 Pro has all the HPI hop-ups available for the car, and he also made a set of custom stabilizer bars to help stiffen the front end. The car is powered by a Trinity D5 modified motor and Dynamite 2400 battery pack, and a Novak ESC provides control. Topping off the car is a Lexus 400 body that Joseph painted himself.



JASON ROBERTS, NEEDVILLE, TX
TAMIYA TXT-1

When the Tamiya TXT-1 came out, Jason tells us that he "just had to have one." Using a Traxxas/Novak EVX ESC, Jason set up the truck with two 6-cell battery packs and two Trinity Monster Maxx motors. The truck is set up with 4-wheel steering, thanks to two high-torque Airtronics servos and a Y-connector. An HPI El Camino body tops off the truck. According to Jason, when he breaks out the truck at his local off-road track, all his buddies stop what they're doing to watch him do donuts and wheelies! Jason's plans include adding a Traxxas E-Maxx tranny: "Then it will have two speeds and a slipper clutch, but until then, I'm just going to drive it like I stole it."

**Got
a New
RTR?
Power it
up with
Reedy!**



Reedy Quasar AC/DC Battery Charger.
Reedy's economical #610 "Quasar" peak-detecting charger plugs right into the wall (or works from any 12V power source) and adjusts from .5 amps to 6.5 amps to charge Ni-CD, Ni-MH or receiver packs.

#610 Reedy Quasar AC/DC Charger

Reedy Tire Warmers. Be ready for racing from the very first lap! Reedy Tire Warmers work from your 6-cell battery pack to pre-heat your touring car's rubber tires to race temperature.

#608 Reedy Tire Warmers



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**Reader's Ride
OF THE
MONTH**

CHAD LEMIRE, VERNON, CT MODIFIED ROCK-CRAWLER KYOSHO USA-1

This cool-looking ride started out as a Bennett Equipment Kyosho USA-1 conversion kit truck. Chad quickly modified it to accommodate a Traxxas E-Maxx drive train and electronics package. He then mounted a set of jumbo Swamp Dawg tires on OFNA rims, and he chose two matched Sanyo 3300 packs for power. Other mods include MIP CVDs, twin Airtronics high-torque steering servos, locked diffs (with JB Weld), a locked-down spur gear and a custom-painted Silverado body. Chad writes that with its "highly modified chassis and 4-link suspension, extreme axle articulation is not a problem."

MACK WIGGINS, ROCKY MOUNT, NC TAMIYA HUMMER

Ten-hut! Major Mack's military Hummer features a Trinity 19-turn powerplant that spins a ball-bearing-supported drive train. Other tweaks include a Tekin Rebel speed control and a Futaba radio setup, and a Dynamite Dyna Sport 1500 battery pack provides the power. Mack uses his truck to run military maneuvers and sorties around the backyard perimeter. At ease, Wiggins! ■



Reedy's "Rated-X" Matched sport packs. Fully assembled in clear tubes so you can see the matching info right on the label of each cell. Don't settle for "mystery" cells in your sport packs... get Reedy's "X-Rated" packs and see the power you've been missing!

#697 Reedy "Rated-X" Sport Pack, Sanyo 3300 cells

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Reedy Ni-MH Receiver Packs for Nitro Cars and Trucks. Reedy receiver packs give you the long-lasting, reliable power needed for nitro racing, and have a great low price that makes them your **BEST** choice!

#615 Reedy Ni-MH Receiver Pack, (Hump style for RC10GT, Monster GT, Etc.)

#614 Reedy Ni-MH Receiver pack, (Flat style for Nitro TC3, etc.)

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\$59.99**

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Reedy "Spec 19 Quad-Mag Motor."

Step up the power of your RTR with Reedy's Quad-Magnet "Spec 19 Motor! A great choice for the B4 RTR, the TC3 RTR, or any Reedy-to-Run electric with a speed control rated for a 19-turn or less motor.

#513 Reedy Spec 19 "Quad-Mag" Motor

A Division of Associated Electrics
3585 Cadillac Ave. Costa Mesa, CA 92626



QUICK-CHANGE PAINT BOTTLES

Any 2-ounce airbrush plastic paint bottle can be converted for a quick change. This can speed things up when you paint with multiple colors, and it's really cheap to do. Just remove the cap and use a body reamer or drill bit to enlarge the opening in the flip-top lid, but make sure that the opening remains slightly smaller than standard silicone fuel tubing.

Next, insert the fuel tubing all the way to the bottom of the paint bottle. Leave 2 inches or so of tubing hanging out the end so it can be hooked up to your airbrush. When you've finished using that paint color, plug the tubing with the nipple that's on top of the lid.

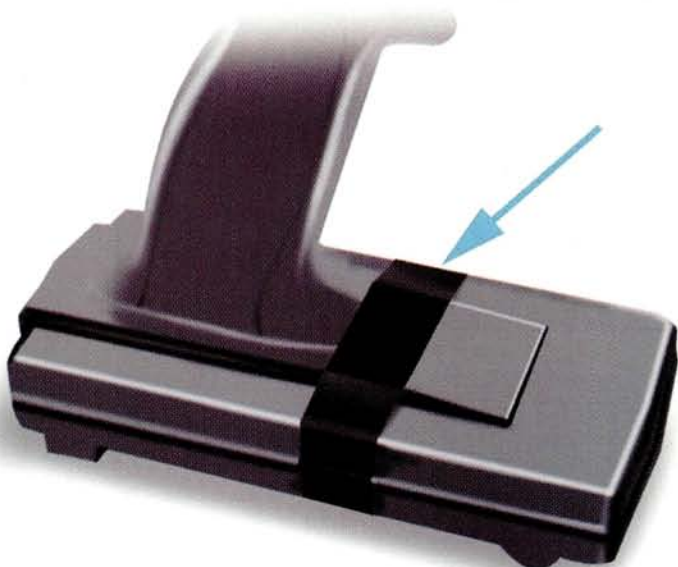
Robert Park
Van Nuys, CA



TRANSMITTER SECURITY

The latches that secure the doors on transmitters with long battery trays on the bottom can weaken to the point that the door slides open during use. A single wrap of electrical tape around the base of the transmitter will prevent the tray from sliding open on its own. The flexible tape can be reused many times. Just peel it back enough to open the door, and then smooth it back down after you slide the door into place.

Steve Veres
Groveland, CA



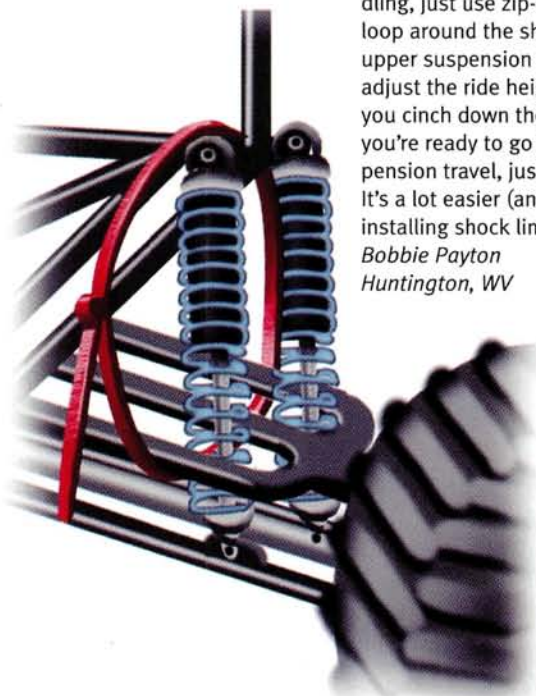
WIN AN OFNA YO-YO & AN RC CAR ACTION SUBSCRIPTION!

Do you have a winning idea? Share it. You could win a 6-month subscription (or an extension of your subscription) and an OFNA yo-yo. The monthly "Tip of the Month" winners will all be considered for a grand prize—an OFNA car kit. Send a sketch or photo to "Pit Tips," *RC Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. Print your name and address clearly, or you won't win a thing. You may also email your tip to pitips@rccaraction.com. Sorry, we just can't acknowledge every tip or return the ones we don't use.

SLAMMED MONSTER

To quickly lower your monster truck's ride height for improved on-road handling, just use zip-ties. Create a big loop around the shock tower and the upper suspension arm. You can adjust the ride height by how much you cinch down the straps. When you're ready to go back to full suspension travel, just snip the zip-ties. It's a lot easier (and neater!) than installing shock limiters.

Bobbie Payton
Huntington, WV



FLOWING FILTER

It's easy to install a Du-Bro fuel filter backward if you're not paying attention. If the filter is installed backward, contaminants will collect on the wrong side of the filter element and can potentially clog the fuel line. Also, if you reinstall a dirty filter backward, then fuel running through the filter will actually carry dirt off the reversed filter and into the carb. To avoid this, use a hobby knife to scribe an arrow on the aluminum casing to indicate the proper direction. Remember that the O-ring should be at the rear of the filter case. For greater visibility, you can fill in the scratched-on arrow with a Sharpie marker.

Peter Martin
Smithfield, RI



RECEIVER PACK ADAPTER

When charging receiver packs for nitro cars, many people strip some wire off a female connector to hook up the charger's alligator clips. This isn't very safe because when connected, the clips will be very close to the exposed leads. An easy fix is to modify the male plug's leads. Simply peel apart the two wires, fold one back against itself and secure it with a wrap of electrical tape. The alligator clips will then be far enough apart for safe charging.

Matt Dalton

Tempe, AZ

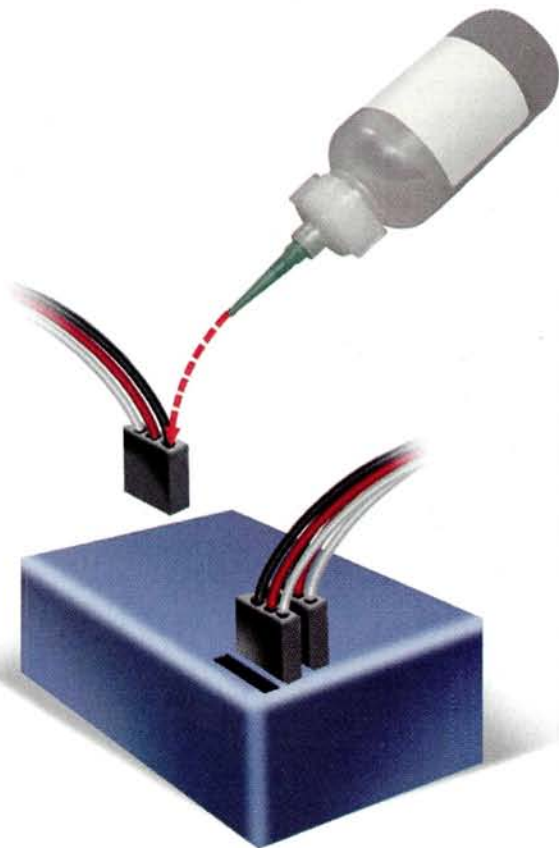
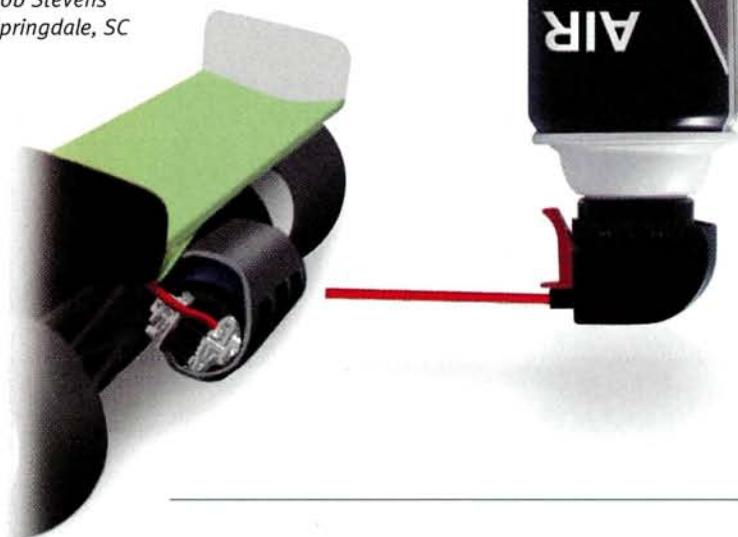


COOL CAN

Electric motors don't make as much power when they're hot as they do when they're cool, so starting a race with a chilled motor can help make your horsepower last longer. Before the race starts, spray the motor with a can of compressed air held inverted so that only the propellant is released. When directed onto the motor's can, the propellant will significantly reduce the motor's temperature.

Bob Stevens

Springdale, SC



CA PLUG RESCUE

ESC and servo connectors use tiny tabs to hold metal contact sockets. If a tab breaks, the socket won't make contact with its pin in the receiver. The fix is easy; instead of creating a mess by trying to cut and splice in a new plug, just use a single drop of CA to hold the pin in place. Slide the pin into the plug until it bottoms out, and then while holding the wires, place a drop of CA on top of the plug where the wires enter.

Tim Hansen

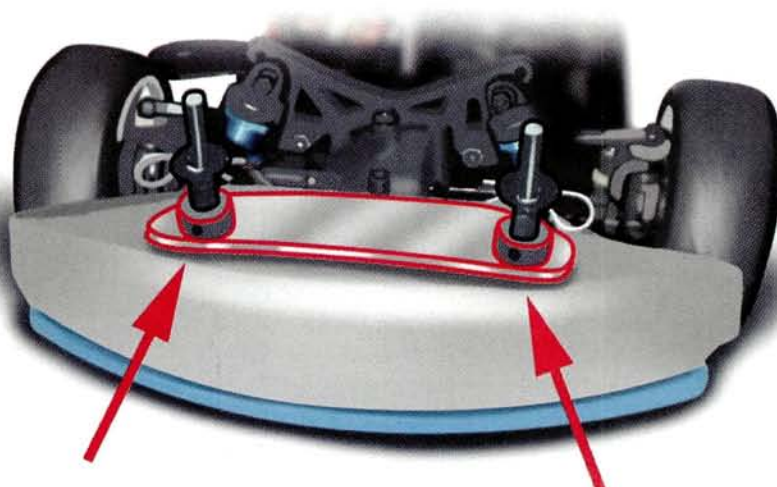
Snyder, PA

BUMPER KEEPER

It's common for bumpers mounted on body posts to ride up the posts and out of position to absorb an impact. Keep the bumper where it belongs by sliding a piece of Lexan over the body posts and on top of the foam bumper. Then, slide two body-post collars on the posts and snug them down on top of the Lexan.

Richard Wilcox

Rossville, MD



"Pit Tips" are submitted by readers and are screened for functionality, feasibility and safety but are not tested by Radio Control Car Action. Radio Control Car Action and the submitting authors are not responsible for personal injury or damage to models or tools resulting from readers' use of "Pit Tips." Readers are strongly encouraged to check their equipment's warranty before they perform any modifications.

Troubleshooting

YOU'VE GOT PROBLEMS? WE'VE GOT FIXES.

BY STEVE POND

► **NEED HELP?** Send your "Troubleshooting" questions and comments to troubleshooting@airage.com, or mail them to "Troubleshooting," c/o RC Car Action, 100 East Ridge, Ridgefield, CT 06877-4606 USA.

Q FICKLE FLYWHEEL

I recently picked up a new engine to replace the one that came with my truck because I want more power to race against my friends. They always beat me because they have faster engines. To fit the new engine, I need to take the clutch and flywheel off my old engine to put them on the new one, but I can't budge the flywheel. I've tried everything I can think of. How can I remove the flywheel without damaging it, or should I just go buy a new one? [email] Todd M.

A There's a fairly simple solution to your problem. I tap the back of the flywheel with a plastic hammer; that usually knocks the flywheel loose. You don't want to hit it so hard that you deform it; just a couple of good, solid taps should get the job done. If the flywheel is really stubborn and requires a little more persuasion, then I suggest that you use a battery-terminal puller or a small gear puller to grab the edges of the flywheel. You'll be surprised at how effortlessly the flywheel comes off when you use a puller. You'll hear a snapping sound as you tighten the puller, and then the flywheel will pretty much fall off the crankshaft.



After the clutch nut has been removed, a tap with a plastic or rubber-tipped hammer will loosen most flywheels.



A small gear puller can be used to remove a very stubborn flywheel.

REAL PERFORMANCE PRODUCTS!

T-Maxx/2.5-Maxx Steel Top Shaft

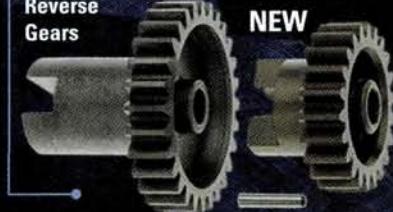
NEW



This precision machined **hardened** steel top shaft will fit all T-Maxx. Includes oversize ball bearing. RRP 8525

T-Maxx/2.5-Maxx Forward Primary and Reverse Gears

NEW



This kit contains a precision machined **hardened** steel primary forward gear, a **hardened** aluminum reverse gear and pin. RRP 8521

T-Maxx/2.5-Maxx Primary Reverse Gear

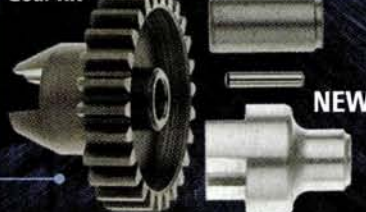
NEW



This gear is precision machined from solid aluminum and **hardened**. Includes pin. RRP 8522

T-Maxx/2.5-Maxx FORWARD ONLY Steel Gear Kit

NEW



This kit contains a 26T **hardened** steel output gear, a forward drive hub adaptor, steel spacer and Pin. RRP 8586. **Hardened** aluminum version RRP 8585.

T-Maxx/2.5-Maxx Hardened Forward Primary Gear

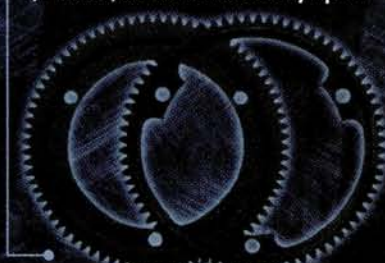
Precision machined from solid steel and then **hardened**. RRP 8529
Hardened aluminum version RRP 8528.



NEW

MAKE NO COMPROMISES!

T/E-Maxx/2.5-Maxx Accessory Spurs



A wide range of spurs fit our Double-Disc Slipper Kits. Choose from machined Super-Tough plastic spurs in 66, 68, 70, 72, 74 and 76T sizes, RRP 82XX, or CNC machined steel spurs available in 65, 72 and 76T sizes, RRP 83XX. Small Clutch Plate/Gear Adaptor fits 65 thru 70T spurs. Large Clutch Plate/Gear Adaptor fits 72 thru 76T spurs.

T-Maxx/2.5-Maxx Lightened Spur And Double-Disc™ Slipper Kit



RRP's NEW line of Lightened Spur and Double-Disc Slipper Kits for Traxxas Nitro and T/E-Maxx/2.5-Maxx trucks are designed to improve performance and increase reliability. This combo incorporates a machined steel or Super-Tough plastic spur, a Vented Aluminum Clutch-Plate/Gear Adaptor, 2 Slipper Pads and Plates to deliver the adjustability you need and the increased performance that you demand. **Complete Slipper Kits** are available in the following sizes: RRP 8166 Slipper Kit with 66T Super-Tough plastic spur (Stock Size) for E-Maxx; RRP 8172 Slipper Kit with 72T Super-Tough plastic spur for Traxxas Nitro; RRP 8465 Slipper Kit with 65T Steel Spur for Traxxas Nitro; RRP 8472 Slipper Kit with 72T Steel Spur (Stock Size) for T-Maxx. Spurs, Clutch-Plate/Gear Adaptor and Slipper Pads also sold separately.

www.robinsonracing.com

Q NOT GETTING MAXX VELOCITY

I have a T-Maxx that I really enjoy, but every once in a while it has had a problem shifting into second gear. In the past, it took a long time to shift gears, but now it has a hard time shifting into second gear at all. The engine revs OK, but when it does shift into second, it takes almost the whole length of a parking lot to get there. I checked the instructions to see how to adjust the transmission, but I couldn't find the correct screw. Do you think there's something wrong with my truck?

V. McNeill
Plattsburgh, NY

A Shifting delays in a T-Maxx transmission can usually be narrowed down to a couple of reasons: the most likely is simply that your fuel-mixture setting requires adjustment. Yes; the fuel-mixture setting can have an impact on the ability of the transmission to shift. The T-Maxx 2-speed relies on engine rpm and acceleration to shift to second gear. When engine performance is compromised by a poor fuel-mixture setting—rich or lean—the engine won't accelerate as quickly or reach its peak rpm. In both cases, the shift to second will be delayed or may not happen. Spend a few minutes tuning the engine, and I think you'll find that the transmission shifts properly when the engine runs well.

The other possibility is that the transmission is out of adjustment. The internal adjustment screw is a little difficult to see, but you can usually find it "by feel" with an Allen wrench. With the wrench in the screw head, turn the screw clockwise to make the transmission shift later; turn it counterclockwise to make it shift earlier. After you've made this adjustment, you have to make sure that the transmission doesn't shift so early that it's in second gear while you think it's stuck in first. The best way to eliminate that as a possibility is to tighten the adjustment screw all the way in (clockwise) until you feel a little resistance; then rotate it $\frac{1}{2}$ turn counterclockwise, and repeat this until you hear the transmission shift into second gear. After you have adjusted the transmission, place a drop of blue thread-lock on the top of your Allen wrench and swirl it around in the hole where the adjustment screw is. Coat the threads to prevent the screw (shift point) from drifting again. It's best to apply the thread-lock after you've completed the adjustment.



Shifting problems are often related to poor fuel-mixture settings. If you take time to optimize the fuel mixture, the transmission should shift more consistently.

T/E-Maxx/2.5-Maxx Steel Diff Gear Set



T/E-Maxx/2.5-Maxx differential gear set, includes: 1 beveled pinion gear, 1 beveled spur gear, 4 re-usable stainless steel phillips head screws, 1 tube Associated Black Grease, and a shim kit for spider gears with 10 .003" shims. 2 sets needed per truck. RRP 8590

T-Maxx/2.5-Maxx Aluminum High Performance Brake Kit



New, lightweight aluminum high performance brake kit, includes bigger, more aggressive brake pads and steel backing plates. One piece vented rotor minimizes side-to-side wobble. Also fits newer T-Maxx. RRP 8562 Older style half shafts use Brake Kit RRP 8560.

DON'T SETTLE FOR SECOND!



T-Maxx Vented Flywheels



Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP 8551 Blue, RRP 8550 Natural Silver
NEW 2.5-Maxx Vented Flywheel, Blue Only RRP 8552.

T/E-Maxx/2.5-Maxx Replacement Pinion



This precision machined steel steel pinion fits RRP 8590 Diff Gear. RRP 8591

T-Maxx/2.5-Maxx Hardened Steel Clutchbells



CNC Machined from solid steel these bells are built to last. They take the 5x11 bearing (NOT included). Available in 19T, RRP 8119, 20T RRP 8120, 21T RRP 8121 and 23T RRP 8123.

ROBINSON RACING PRODUCTS

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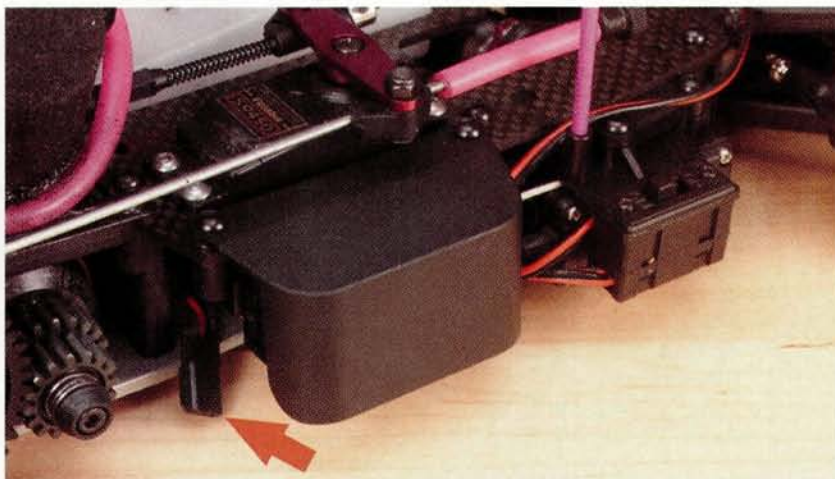
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PACK PROTOCOL

I'm pretty new to nitro, but I'm tired of spending money on alkaline batteries for my radio and receiver. I just picked up an 1100mAh rechargeable receiver pack for my truck and will save up to buy rechargeable batteries for the radio. What's the best way to connect the pack to the receiver? The wire on the receiver pack isn't long enough to reach the receiver. Also, can I use a regular peak-charger to charge the receiver pack, and if I can, how quickly can I charge it? Last, how do I connect the pack to a fast-charger? I haven't seen any connectors or adapters that would allow me to do this. The trickle-charger that came with my radio has a plug that's attached to the receiver battery, but the guy at the hobby shop said it would take 16 hours to charge my 1100mAh pack.

B. Heibeck

Clear Lake, CA



To connect the receiver pack to the receiver, I use an on/off switch that has a charge lead (a Futaba FPC8J or an Airtronics 97001Z, for example). These switches have three plugs: one is connected to the receiver, another is connected to the battery pack, and the third plug is attached to the charger. The alternative is to use a servo-extension lead, but you'll have to plug and unplug it from the receiver whenever you run your vehicle or charge the battery. Using an on/off switch makes it easier to charge the receiver pack, and there's less wear and tear on the plug.

You can use a peak-charger to charge a receiver pack as long as the charger is compatible with NiMH packs and charges at a rate of 1 amp or less. At 1 amp, the receiver pack will be fully charged in a little more than an hour. Charging at rates of above 1 amp can cause false peaking, so I don't recommend that you use higher charge rates.

Physically attaching a peak charger to a receiver pack requires an adapter. I snipped a plug off an old switch and soldered an Acer Racing Powerpole connector to the battery pack's bare leads. The connector provides a surface to which the alligator clips from the charger can be connected, and it prevents bare wires and charger clips from contacting one another. An unintentional short can smoke the switch, the charger and the receiver pack, so be sure to fashion an adapter that will avoid the chance of a short circuit.

Some radio switches have a third plug to connect a charger to the receiver battery pack so you don't have to unplug the receiver pack for charging. The charge lead on this car has been routed by the receiver pack for easy access.

RC10-GT Steel Combo



Precision machined from solid steel, then hardened, this 65T spur and 15T bell combo will last and last. RRP 2365

RC10-GT Hardened Steel Idler Gear



Cut from solid steel stock, this RC10-GT gear is lightened and hardened for super quiet precision and extra long life. Black tranny grease included. RRP 2213

Associated Titanium Stealth Top Shaft



CNC Machined from solid titanium, this super hard, super light top shaft will fit any Stealth transmission. RRP 1512.

RC-10GT Hardened Steel Clutchbells



These steel Clutch Bells are CNC machined from solid steel then the teeth are machined on. This makes the part stronger with less gear "run out". Available in 14T thru 20T, 22T and 24T. RRP 22XX

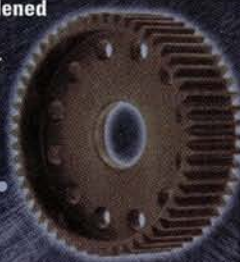
www.robinsonracing.com

RC-10GT 32 Pitch Spurs



Precision machined from heat-resistant, super tough plastic, these spurs mesh flawlessly with our Clutchbells. Available in 63T thru 67T. RRP 2263 - RRP 2267.

Hardened Diff Gear



Hard anodized, precision CNC machined aluminum diff gear. RRP 1513 RC10-GT



DON'T SETTLE FOR SECOND!

TC3 Ultra 48 Pitch Spurs



Precision machined from heat-resistant plastic, these spurs mesh flawlessly with our pinions. Available in even numbers from 70T thru 80T. RRP 1670 - RRP 1680.

Q ANTENNA ANXIETY

I keep ripping the antenna wire off my receiver. Can you suggest how I can avoid doing this? I've had to send my receiver to the repair center three times to have the antenna wire replaced. I thought the wire was much longer than it needed to be, and after I had cut it the first time, I figured out that you can't do that (that was my first repair). The wire sticks out of the antenna tube by about 6 inches, and it gets tangled in the wheels of my car (and other cars). I was told that for best reception, I should let the antenna hang out of the antenna tube, but that's what causes the wire to be ripped off. How can I avoid damaging to the antenna wire without hurting the reception? [email]

Andrew H.



Avoid ripping out your antenna wire by using an antenna cap. Short sections of wire insulation from 12- to 14-gauge wire work well to hold the extra length of antenna wire to the outside of the antenna tube.

A You do want to have a sufficient length of antenna wire outside the body to ensure the best reception, but it doesn't have to dangle in the wind. Buy a longer antenna tube or fold the antenna wire over the outside of the existing tube. I use a couple of O-rings, pieces of wire insulation, or shrink-wrap to hold the wire on the tube. This keeps it out of harm's way and doesn't compromise the reception.

Coiling the antenna wire under the body will compromise reception slightly, but I've done it many times without any problems. If you would rather do this, wrap the wire uniformly around a piece of plastic sheet or cardboard, and keep it away from the motor and electronic components. Just be sure to test the radio range when you've finished. ■

TOOLBOX

Trinity Fan-Stands

Trinity has taken the concept of the foam car stand to the next level. These new stands include electric fans to cool the powerplant of your



electric or nitro-powered vehicle. The stand for the B4 has a fan placed just beyond the back of the motor plate. The

fan-cooled nitro stand has two fans; the larger one cools the engine, and a smaller fan cools the tuned pipe. This stand works for both belt and shaft-drive machines, regardless of which side the pipe is mounted on. A version is also available for the new Trinity Reflex 12 (not pictured).

Associated B4—Item no. TRI30001; \$14.99
 Nitro—TRI30002; \$21.99
 Reflex 12—TRI30004; \$14.99
 Trinity Products Inc. (732) 635-1600;
 teamtrinity.com.

HPI Savage 21 Nitro Steel Combo



This new 52 tooth Spur and 14 tooth Clutch Bell are CNC machined from solid steel and then hardened for unmatched performance and durability. RRP 7052

NEW

HPI Savage 21 Nitro Vented Flywheel



Aluminum vented flywheels move air over clutch bell, improving performance and cooling. RRP 7000

NEW

Stealth Spurs



These precision machined spur gears are super quiet. They're available in 48P in 60T thru 96T sizes, and fit any Associated or HPI electric car or truck. RRP 1860 thru RRP 1896.

Electric Car And Truck Pinions:

48P Absolute Series Pinions



Super hard, lightened and cut with unmatched precision. Great with any spur, but with an Absolute spur, even on-off noise is gone! Available in 48P in 16T thru 28T sizes. RRP 1416 - RRP 1428.

48P / 64P SuperLite Aluminum Pinions



They're lightened, hard coated and precision cut. Available in 48P in 16T thru 28T, and 64P in 24T thru 38T. RRP 30XX (48P) and RRP 31XX (64P). Only \$5.25

48P Hard Nickel Plated Steel Pinions



These precision cut gears have an extremely hard coating that makes them really last. Available in 12T thru 35T. RRP 1012 - RRP 1035

2003

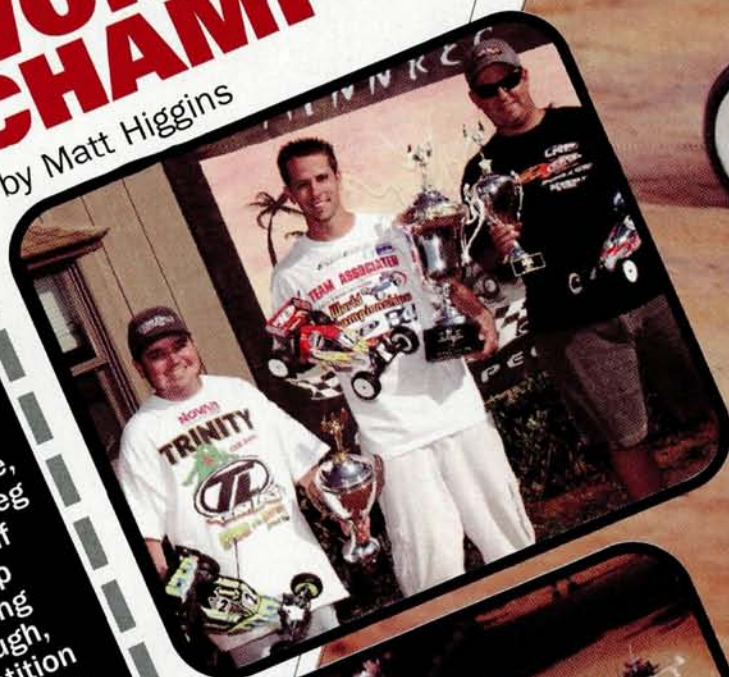
IFMAR ELECTRIC OFF-ROAD WORLD CHAMPIONSHIPS

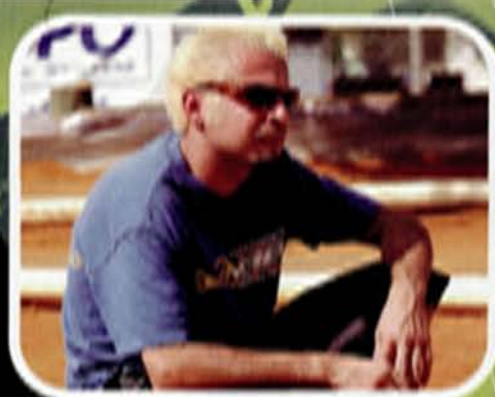
by Matt Higgins

Photos by Jason Sams & Matt Higgins

Every two years, the leading off-road racers from around the globe gather for one of the most prestigious titles in RC racing. These racers have three qualities in common: the dedication, the knowledge and the natural ability to be able to vie for the title of world champion—the best of the best. The race is the IFMAR Electric Off-Road World Championships, and this time, the battle took place on the blue-groove, clay track of the Minnreg RC Club in Largo, FL. If having the world's top contenders competing heads up isn't enough, the level of competition between manufacturers has escalated yet again with the release of Team Associated's B4 Stealth buggy. Things are most certainly heating up on the racing front. Read on and check out how it all went down.

LoSi vs.
Associated,
Trinity vs.
Reedy
in the war
of the
Worlds





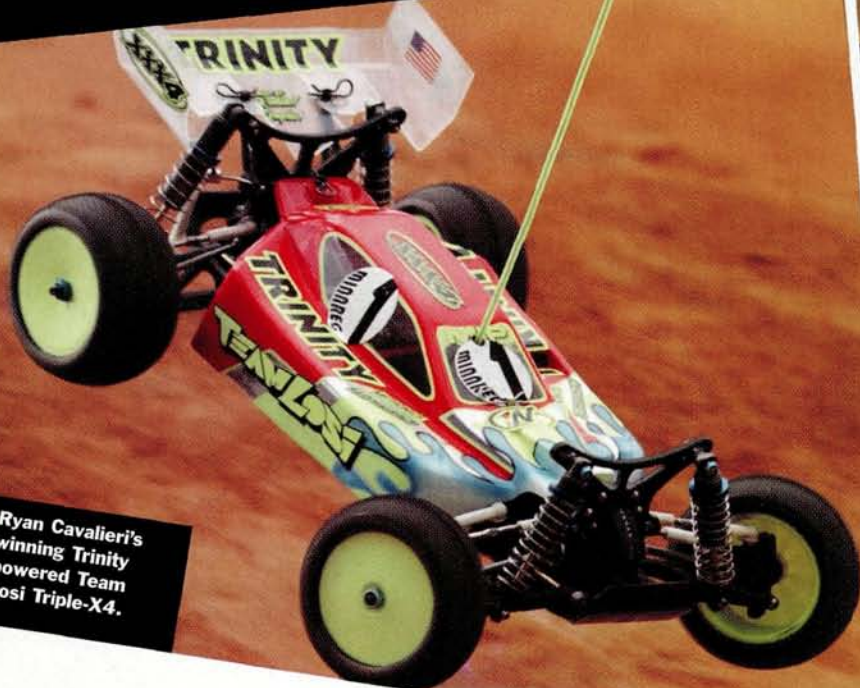
Sponsored by Team Associated and Reedy
Team Losi, NO Propo, Novak Electronics, Superior Hobbies

FIMAR ELECTRIC OFF-ROAD WORLD CHAMPIONSHIPS



4WD QUALIFYING

Team Losi's Brian Kinwald and Matt Francis were the two fastest qualifying drivers, and both put down the only 14-lap runs. While staying in the fast 13-lap range, Ryan Cavalieri was more consistent than Francis was through the five qualifying rounds, so he grabbed the second starting position from his teammate who had to settle for third on the grid. Which of the 10 A-main drivers would win the event was anyone's guess, but the winner would almost certainly be driving a Triple-X4. Losi owned nine of the 10 spots on the A-main grid.



Ryan Cavalieri's winning Trinity powered Team Losi Triple-X4.

In less than a second after this shot was snapped, Cavalieri made the pass that decided the outcome of the 4WD Worlds.



The 4WD top three from left to right: Brian Kinwald, Ryan Cavalieri and Mike Truhe

4WD Mains

A1 At the starting tone of the first of the three A-mains, all 10 racers took off in their starting order, and they all set a conservative pace as they sized one another up early in the race. With the cars lined up closely and running in their starting positions, there were no position changes until lap four, when Matt Francis cut a corner too tightly and hit a pipe hard enough to break the front end of his buggy. From that

buggy into a pipe, so Cavalieri slipped by for the lead. Pushing too hard to catch up, Kinwald flipped on the doubles as he drove toward the drivers' stand and thus ensured the first A-main victory for Cavalieri. Kinwald lost the lead, but he wasn't slowed enough to lose second place.

A2 The second A-main had a much rougher start than the first one. Cavalieri's poor launch at the starting

again slammed his car into a pipe while cornering too tightly.

A3 The third and final A-main yielded a smooth, clean start much like the first. In the opening laps, Kinwald and Cavalieri broke out together to settle who would leave Florida as the new IFMAR World Champion of the 4WD electric class.

off to avoid wrecking them both. This literally happened on every lap, in corner after corner.

As the minutes wound down, the two extremely close-running Losi buggies eventually collided and went over the doubles directly in

LAP AFTER LAP, CAVALIERI POKED THE NOSE OF HIS TRIPLE-X4 UNDER KINWALD'S BUGGY AS THEY ENTERED EACH CORNER.

point on, the focus shifted to the duel between top qualifier and leader Brian Kinwald and second-place starter Ryan Cavalieri as they distanced themselves from the rest of the A-main group.

Late in the race with Cavalieri in close pursuit, Kinwald stuck his

tone caused a first-turn traffic jam that allowed Kinwald to lead the race from tone to tone without contest. Cavalieri managed to work his way to the second position after falling as far back as fifth. Francis uncharacteristically took himself out of the second Main in a row when he

The trackside spectators were treated to an impressive driving display. Lap after lap, Cavalieri poked the nose of his Triple-X4 under Kinwald's buggy as they entered each corner. Each time, Kinwald moved to close the door to prevent the pass, and each time, Cavalieri let

front of the drivers' stand with Cavalieri coming out in front of Kinwald. Once clear of the landing area, in an unprecedented and very wise move, Cavalieri slowed and let Kinwald reclaim the lead. If Cavalieri had continued, he would have suffered a stop-and-go penalty at the

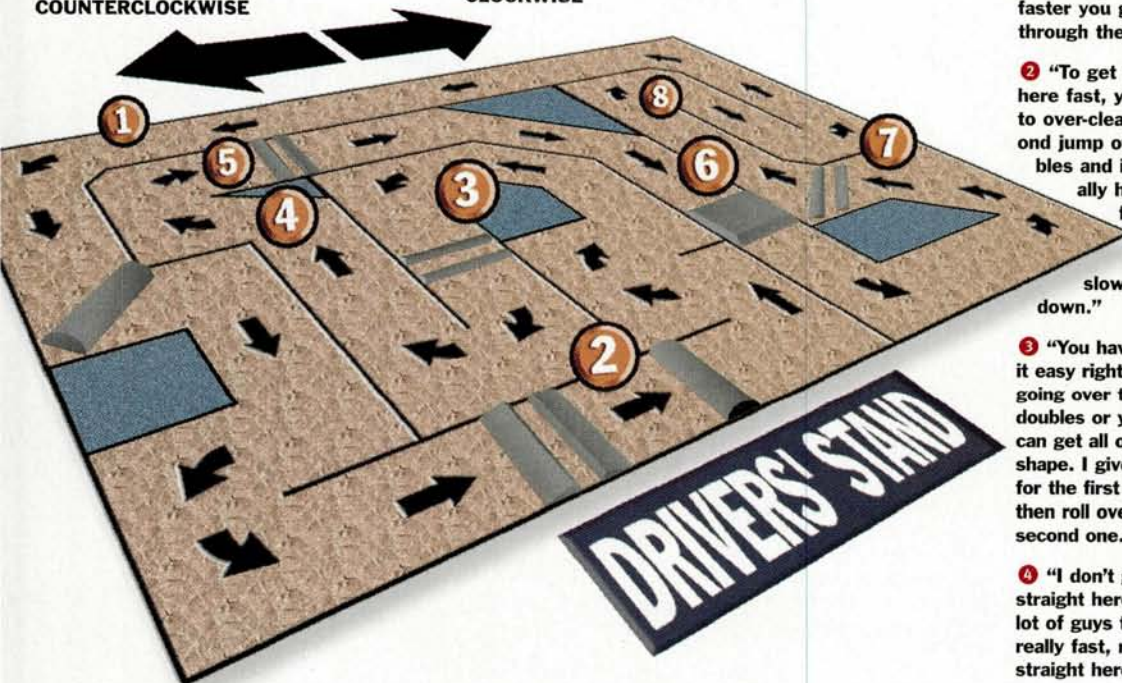


TAKE A HOT LAP WITH 4WD WORLD CHAMPION RYAN CAVALIERI

While waiting for the official results of the 4WD World Championship to be announced, eventual champion Ryan Cavalieri walked around the terrific Minnreg racetrack to show us how it's done.

4WD RUNS
COUNTERCLOCKWISE

2WD RUNS
CLOCKWISE



1 "Going down the straight, I let off about $\frac{3}{4}$ or even $\frac{2}{3}$ of the way down and then just coasted around the turn. The slower you go down the straightaway, the faster you go through the infield."

2 "To get through here fast, you want to over-clear the second jump of the doubles and intentionally hit the face of the roller to slow the car down."

3 "You have to take it easy right here going over these doubles or your car can get all out of shape. I give it gas for the first jump and then roll over the second one."

4 "I don't go fully straight here at all. A lot of guys try to go really fast, really straight here, and a

lot of guys have hit here."

5 "These double jumps are hard to clear. I try to down-side the second jump really smooth. I also try to stay to the outside to get in position for the next big turn."

6 "I over-jump the tabletop and get the front end down while in the air so that it digs in a bit and sets me up for the next corner."

7 "I go over these doubles full punch and purposely over-jump them. I also cock my wheels when hitting the face of the jump to set up the direction my car will go through the air."

8 "Going around this hairpin, I come in full punch and just slide it around and punch it."

IFMAR Electric Off-Road Worlds Winners

4WD Class

Fin	Qual	Driver	Country	Chassis	Motor	Battery	ESC	Radio	Tires	Pinion/Spur
1	2	Ryan Cavalieri	USA	Losi Triple-X4 GP	Trinity D5 10x3	Trinity GP 3300	Novak	Airtronics M8	Handout	17/92
2	1	Brian Kinwald	USA	Losi Triple-X4 GP	Trinity D5 10x2	Trinity GP 3300	Novak	Airtronics M8	Handout	18/94
3	5	Mike Truhe	USA	Losi Triple-X4 GP	Orion Revolution 10x1	Orion GP 3300	Novak	Airtronics M8	Handout	17/92
4	4	Greg Hodapp	USA	Losi Triple-X4 GP	Peak Vantage 10x1	Peak GP 3300	Novak	Airtronics M8	Handout	17/92
5	8	Marcus Luebke	Germany	Losi Triple-X4 GP	Orion V2 10x1	Orion GP 3300	CS Rocket Max	Sanwa M8	Handout	17/92
6	6	Jimmy Babcock	USA	Losi Triple-X4 GP	Orion Revolution 10x1	Orion GP 3300	LRP QC2	Airtronics M8	Handout	17/92
7	10	Richard Taylor	England	Losi Triple-X4 GP	LRP 10x2	LRP GP 3300	LRP QC2	KO Propo Esprit II	Handout	17/92
8	7	Billy Easton	USA	Yokomo MR4-BC	Reedy 10x2	Reedy GP 3300	LRP QC2	Airtronics M8	Handout	17/84
9	3	Matt Francis	USA	Losi Triple-X4 GP	Trinity D5 10x3	Trinity GP 3300	LRP QC2	Airtronics M8	Handout	18/94
10	9	Jon Ringer	USA	Losi Triple-X4 GP	Fantom 10x2	SMC GP 3300	Novak	Airtronics M8	Handout	17/92

hands of the IFMAR referee. He then would have had no chance of challenging for the win; but Cavalieri let Kinwald regain the lead and tucked right back in behind him.

With time expired and only the final lap to decide the outcome, Cavalieri pushed hard on Kinwald. In the sweeper-type turn after the tabletop jump, Kinwald went wide. Seeing what was certainly his last

chance, Cavalieri dived to the inside of Kinwald, and that put them side by side in the turn leading to the doubles. Kinwald tried to prevent the pass by tightening up his line, but Cavalieri was already in position on the inside of the corner. There was no chance of Cavalieri backing off this time, and they hit; this sent Kinwald up on

two wheels. After the collision, Cavalieri did seem to hesitate ever so slightly, but he then throttled off into the lead. It was such a brief pause that it is impossible to know whether the young driver was contemplating letting Kinwald reclaim the position or whether he was

just letting his buggy settle back down before taking off. Kinwald held on to second uncontested as Cavalieri streaked across the finish line as the new IFMAR 4WD Electric World Champion.

2003 IFMAR ELECTRIC OFF-ROAD WORLD CHAMPIONSHIPS



Do a little dance ...



On his birthday, Peak Performance's Rick Hohwart was lucky enough to get the only shaded corner marshalling spot.



Oscar Jansen had a very neat pit. Mike Truhe did not.



Team Trinity/Team Losi's Matt Francis.



Jason Rouna of Team Associated and Reedy



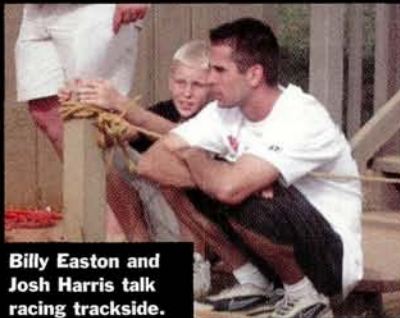
Wrecked 'em? Damn near killed 'em!



"... is better," says LRP president Jürgen Lautenbach.



"Is that RC Pro-Am?"



Billy Easton and Josh Harris talk racing trackside.



Ker's WINGHOUSE

Don and Jane McMillan have raced for more than 17 years.



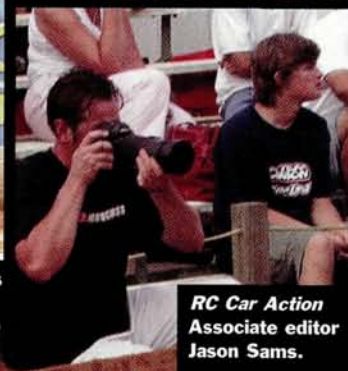
"Yup, I just won the Worlds."



Race Director Kenny Holmes.

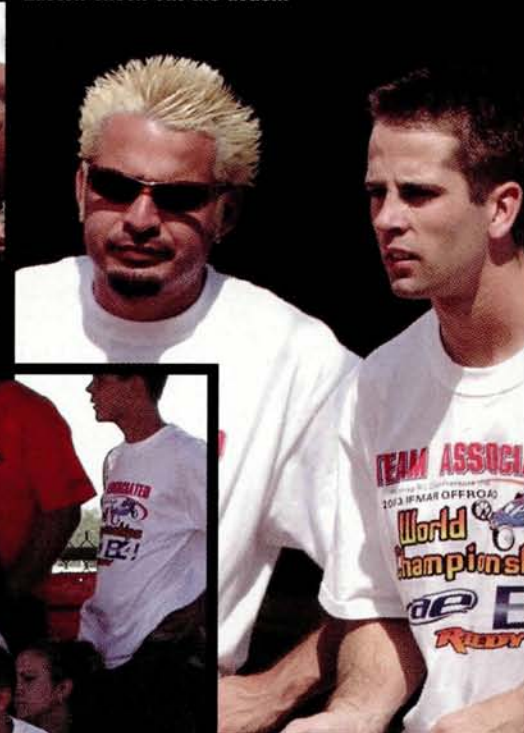


Team Associated's Jared Tebo.



RC Car Action Associate editor Jason Sams.

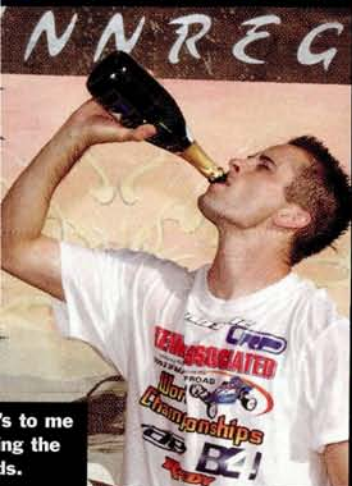
Travis Amezcua and Billy Easton check out the action.



Delays are inevitable at the big races.



"Car number 9 ... car number 9 hasn't checked in. Hello? Bueller ... Bueller...."



's to me
ing the
ds.



THE WORLDS

2WD QUALIFYING

The last round of qualifying held before the Mains on Saturday proved to be very important, as the track got much faster with each heat. With Kinwald running in the first heat of the day, and Easton running in the last, this was the deciding factor in who was the 2WD class top qualifier. Kinwald drove a perfect race, but he was far off his fastest pace. Easton, on the other hand, ran his heat at his full race pace and ended up as the TQ for the 2WD class. The stage was set for the ultimate showdown between the Associated/Reedy camp and the Team Losi/Trinity contingent.

2WD Mains

A1 While top qualifier Billy Easton and his closest competitor Brian Kinwald slowly separated

Reedy-powered Associated B4 away from Kinwald for the win. The real battle on the track took place between Losi's Matt Francis (who had jumped up a few spots on the tone) and Associated's Mark

faster lap times than Kinwald, he eventually pulled away. With most of their lap times separated by an ever-so-slim margin, the top qualifier position certainly paid off because Easton was in front, but quite possibly not fast enough to

Easton had done in the previous two Mains, Kinwald slowly distanced himself from the rest of the field. The primary battle was again between Pavidis and Francis. After swapping positions a few times early in the race, Pavidis held the lead on a very close Francis until he went too hot in

THE PRIMARY BATTLE WAS BETWEEN PAVIDIS AND FRANCIS.

themselves from the rest of the pack, there was quite a bit of position shuffling early in the first A-main. Billy Easton drove a flawless race and eventually pulled his

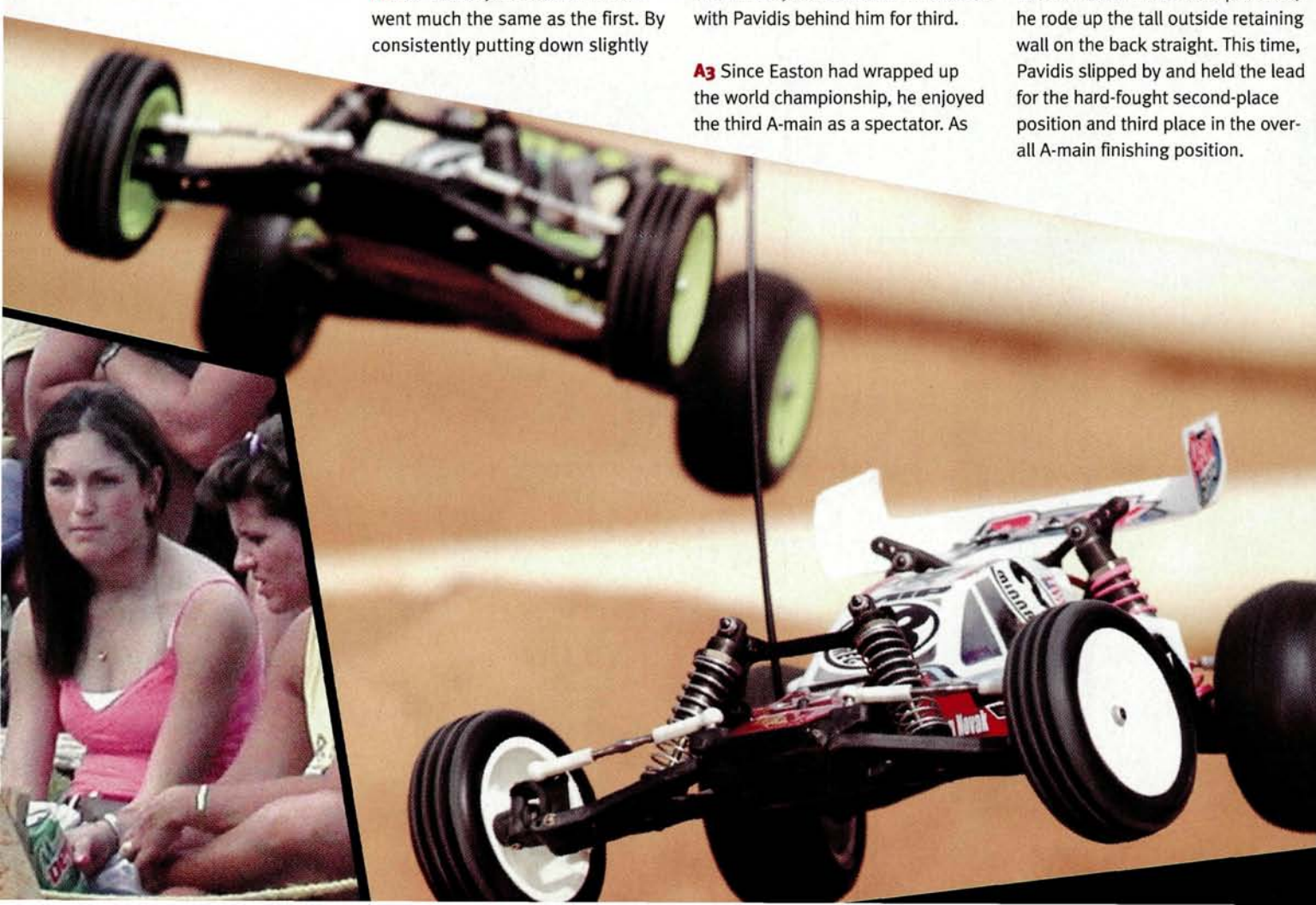
Pavidis. These two ran close the whole race, but Francis took advantage of a bobble by Pavidis and drove into the third position.

A2 For Easton, the second A-main went much the same as the first. By consistently putting down slightly

pass Kinwald if he had to. Easton won the second A-main and clinched the title of World Champion, adding yet another IFMAR trophy to the Associated/Reedy collection. Meanwhile, Kinwald rolled in second with Pavidis behind him for third.

A3 Since Easton had wrapped up the world championship, he enjoyed the third A-main as a spectator. As

the sweeper at the end of the high-speed straight and washed out a little wide. Francis was right there, and he cleanly slipped by for the position. On the next lap, it was Francis who bobbed while under pressure; he rode up the tall outside retaining wall on the back straight. This time, Pavidis slipped by and held the lead for the hard-fought second-place position and third place in the overall A-main finishing position.





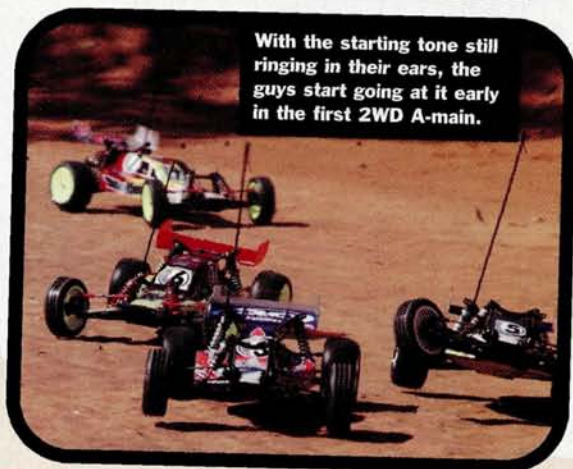
The 2WD top three from left to right: Mark Pavidis, Billy Easton and Brian Kinwald.



2003 1/10th SCALE ELECTRIC OFF-ROAD WORLD CHAMPIONSHIP



Mark Pavidis does his best Ricky Carmichael impression by whippin' it over a set of doubles.



With the starting tone still ringing in their ears, the guys start going at it early in the first 2WD A-main.

IFMAR Electric Off-Road Worlds Winners

2WD Class

Fin	Qual	Driver	Country	Chassis	Motor	Battery	ESC	Radio	Tires	Pinion/Spur
1	1	Billy Easton	USA	Associated B4	Reedy Kr 14x2	Reedy GP 3300	LRP QC2	Airtronics M8	Handout	23/78
2	2	Brian Kinwald	USA	Losi Triple-X BK2	Trinity D5 13x2	Trinity GP 3300	Novak	Airtronics M8	Handout	24/78
3	3	Mark Pavidis	USA	Associated B4	Reedy Kr 14x2	Reedy X-Cell	GP 3300 LRP QC2	Airtronics M8	Handout	25/81
4	6	Matt Francis	USA	Losi Triple-X BK2	Trinity D5 13x2	Trinity GP 3300	LRP QC2	Airtronics M8	Handout	24/78
5	10	Lloyd Dassonville	USA	Associated B4	Reedy Kr 14x2	Reedy GP 3300	LRP QC2	Airtronics M8	Handout	24/78
6	4	Jukka Steenari	Finland	Losi Triple-X BK2	Orion Revolution 14x2	Orion GP 3300	Novak	Airtronics M8	Handout	24/78
7	8	Jimmy Babcock	USA	Losi Triple-X BK2	Orion Revolution 13x2	Orion GP 3300	LRP QC2	Airtronics M8	Handout	23/78
8	7	Joe Pillars	USA	Losi Triple-X BK2	Peak Vantage 13x2	Peak GP 3300	LRP QC2	Airtronics M8	Handout	24/78
9	5	Jason Rouna	USA	Associated B4	Reedy Kr 14x2	Reedy X-Cell	GP 3300 LRP QC2	Airtronics M8	Handout	25/81
10	9	Rick Hohwart	USA	Losi Triple-X BK2	Peak Vantage 13x2	Peak GP 3300	Novak	Airtronics M8	Handout	23/78

FAST TRACK FACTS



→ Only four drivers made the A-main in both classes: Jimmy Babcock, Matt Francis and Brian Kinwald from Team Losi and Billy Easton from Team Associated.

→ There was one fire in the pits. No one was hurt.

→ The smooth, blue-groove clay Minnreg track measures 100x70 feet.

→ More than once, a squirrel tempted fate by running on the track during the races. Again, no one was hurt. Lucky squirrel.

→ Ryan Cavalieri ran the fastest 4WD A-main lap at 22.5 seconds.

→ Minnregcrrc.com is a website worth checking out.

→ Mark Pavidis and Brian Kinwald shared the fastest time for a 2WD A-main lap at 23.4 seconds.

→ The track food was very good and cheap; the fresh-baked cookies went fast!

→ The fastest 4WD A-main time was set by Ryan Cavalieri with 14 laps in 5:17.92 in the first A-main.

→ The 4WD class ran counterclockwise, and the 2WD raced clockwise.

→ Billy Easton set the fastest 2WD A-main time with 14 laps in 5:19.88 in the second A-main.

→ The Minnreg club has only been around since '97, and in that short time, it has developed into one of the best off-road tracks in the world.

→ 4,987,567,786 is the number of times I heard someone from California say "Dude."

RACERS ON THE RADAR



MIKE TRUHE

AGE: 20
STOMPING GROUND: Torrance, CA
HOME TRACK: SoCal
YEARS IN THE GAME: three
SPONSORS: Team

Novak, Stunner Graphics and Pleazer Paints
IF NOT RC PRO, THEN WHICH SPORT? Golf
WHY HE'S ON THE RADAR: Mike made himself known when he grabbed third in the 4WD class of the Electric Off-Road Worlds. He's also one of the nicest guys you will find in the pits, and if you get him and his buddy Andrew Swanson going, you might never stop laughing.



JOSH HARRIS

AGE: 13
STOMPING GROUND: Winter Park, FL
HOME TRACK: Minnreg
YEARS IN THE GAME: three
IF NOT RC PRO, THEN WHICH SPORT? Football
SPONSORS: Associated, Reedy and LRP

WHY HE'S ON THE RADAR: Josh showed that he can hang at the Worlds and was actually one of the fastest in the fifth and final round of 2WD qualifying; he was seventh fastest in that round! Besides being able to lay the smack down on the track, this guy is smart enough to have Duke University and other top schools knocking on his door; slow down guys, he's only 13.



JESSE ROBBERS

AGE: 22
STOMPING GROUND: Cincinnati, OH
HOME TRACK: CRCRC
YEARS IN THE GAME: six
IF NOT RC PRO, THEN WHICH SPORT? Motocross

SPONSORS: Team Losi, Fantom, SMC, Novak and Skip Gear

WHY HE'S ON THE RADAR: at the Winter Midwest Champs, Jesse TQ'd and won 2WD Stock, Mod Buggy and 4WD. He also took the win at the Indoor Gas Champs. At the Mod Nats, Jesse showed he has no problem competing with the nation's best by placing fifth in the 4WD class.

JARED TEBO

AGE: 16
STOMPING GROUND: Rosamond, CA
HOME TRACK: Hemet
YEARS IN THE GAME: four
IF NOT RC PRO, THEN WHICH SPORT? Motocross
SPONSORS: Team

Associated, Thunder Tiger, Reedy, O'Donnell, Pro-Line, Airtronics, Hudy, XXX-Main and Smith
WHY HE'S ON THE RADAR: besides being a young gun, Jared has transitioned from nitro dominance into being a well-rounded force in all types of RC racing. You're bound to see Tebo in the A-main at many tracks and in a variety of classes in 2004. Team Associated is certainly counting on his talents to keep the championships rolling in the future.



JIMMY BABCOCK

AGE: 29
STOMPING GROUND: Canyon County, CA
HOME TRACK: Hot Rod Hobbies
YEARS IN THE GAME: 13
IF NOT RC PRO, THEN WHICH SPORT? Basketball

SPONSORS: Team Orion, Team Losi, Hot Rod Hobbies, Airtronics, LRP, MIP and Ren-Blast Graphics

WHY HE'S ON THE RADAR: although Jimmy has a good share of racing experience under his belt, this is the first time he has ever made the A-main at a Worlds. He brought his "A" game for both 4WD and 2WD and is sure to keep it rolling for '04. He is also running a new off-road racing series at tracks all over Southern California; check it out at jimmybabcock.com.



JOE PILLARS

AGE: 21
STOMPING GROUND: Costa Mesa, CA
HOME TRACK: SoCal
YEARS IN THE GAME: six
IF NOT RC PRO, THEN WHICH SPORT? Motocross

Sponsors: Team Orion, Peak Performance, Team Losi, LRP, Darkside Designs and Vinyl Graphics Unlimited

WHY HE'S ON THE RADAR: Joe is not only a motor master who helps the Orion and Peak camps go fast, but he also landed himself in the 2WD A-main at the Worlds. He is also one of the easiest guys to approach and talk with.



"Ryan Cavalieri is the s _ _ _!" —Two-time world champion, Jukka Steenari, on the new world champion's driving in the A-main.

"The language barrier is killing me. Pointing and saying 'no' only goes so far." —Tech Inspector, Chuck Mann, when asked what he found to be the hardest part of running tech.

Say What?

"Just that first turn." —Ryan Cavalieri, who started second, when asked what he was most nervous about for the 4WD A-main.

"I'm getting about 10 minutes of sleep a night." —Race Director Ken "Scarecrow" Holmes explaining that he couldn't take the week off and has to go right to work after each day of racing.

"I'M NERVOUS JUST WATCHING." —SPECTATOR SPEAKING ABOUT THE ACTION IN THE 2WD A-MAIN.

"It seems so fast. It's so big compared to what I usually run. We don't have any hard-packed tracks. I was really surprised by the conditions." —Kuniaki Noguchi of Japan (who runs for the Kyosho team), when asked what he thought of the Minnreg track.

"When they try to make up for it, that's when they screw up." —Gil "Pops" Losi Sr., while watching one of his top drivers try to make up for a mistake on the track during 2WD qualifying.

"The track doesn't have any standout challenging parts, but that makes it almost harder. You have to be perfect all the way around. Ultimately, you can only go as fast as the track will let you." —Mike Truhe, who finished third in the 4WD class, commenting on the Minnreg track.

"Win, lose or draw; as long as the racing's clean, it will be great." —Team Associated's Mike Ogle, the day before his team left for the Worlds.

"The plan's to go to the front, not the back. What am I going to do—take them all out one at a time and work my way to the top? I don't drive like that. I am only one driver in ten, but they all are so worried about me."

—Billy Easton, who piloted the only non-Losi vehicle, as he commented on how things were working out in the 4WD A-mains.

"The toughest part is just the ever-changing track condition."

—said by just about every driver when we asked them what they thought about the track during qualifying on Monday.

"That's pretty funky looking. It looks like someone stepped on it." —Jose Zayas, as he checked out the Tenth Tech Predator 4WD buggy during qualifying.

"Cool? Calm? You can't see our insides." —Gregg Hodapp lightheartedly answered comments just minutes before taking the drivers' stand for the 4WD A-main.

"It's the A-main! You gotta go!" —Jimmy Babcock, as a reply to comments from a fellow racer about a rough start in the 2WD A-main.

2003 IFMAR ELECTRIC OFF-ROAD WORLD CHAMPIONSHIPS

CHAMPS: PAST AND PRESENT

Year	Champion	Country	Venue	Class
1985	Jay Halsey	USA	USA	Stock
	Gil Losi Jr.	USA	England	Unlimited
1987	Joel Johnson	USA	—	2WD
	Masami Hirotsaka	Japan	Australia	4WD
1989	Masami Hirotsaka	Japan	—	2WD
	Masami Hirotsaka	Japan	USA	4WD
1991	Masami Hirotsaka	USA	—	2WD
	Masami Hirotsaka	USA	England	4WD
1993	Cliff Lett	Japan	—	2WD
	Brian Kinwald	USA	Japan	4WD
1995	Masami Hirotsaka	USA	—	2WD
	Matt Francis	USA	USA	4WD
1997	Brian Kinwald	Japan	—	2WD
	Masami Hirotsaka	Japan	Finland	4WD
1999	Masami Hirotsaka	USA	—	2WD
	Masami Steenari	Finland	South Africa	4WD
2001	Jukka Steenari	USA	—	2WD
	Matt Francis	USA	USA	4WD
2003	Billy Easton	—	—	—
	Ryan Cavalieri	—	—	—

The IFMAR system

The IFMAR

World Championship racing system used for the Electric Off-Road Worlds relies on an elaborate qualifying procedure that's designed to ensure fairness. Each racer participates in five qualifying races; they compete only against the clock for the fastest time. As in other races, the fastest group

(in this case, 10 racers) is placed in the A-main and so on down the line. Here's how it works:

- Each qualifying heat uses the staggered start commonly known as the IFMAR start: the drivers are signaled to start one at a time. Because a track changes quite a bit during the day, the order of the heats is shuffled for each round. For example, if a racer runs in the first race of round one, he would be in the fourth race for round two. This is how IFMAR

attempts to reduce the "rocket run" phenomenon, which is when some racers have the luck to always run when the track is at its best.

- After five rounds have been completed, the scores from each racer's best three rounds are counted for ranking in the Mains. A point system is used; the fastest driver in a round scores zero, the second fastest driver gets one point and so on. The driver with the lowest total points from his three best rounds is then top qualifier for that class.
- The system used for the Mains is

much simpler. All the Mains use a heads-up start (all 10 racers take off at the same time), and all of them, with the exception of the A-main, have only one round. The A-main is run three times, and each driver's best two rounds count. Winning an A-main is worth 100 points with a reduction of one point for each subsequent lower place.

The wrap-up

The Electric Off-Road World Championship is probably the best known and most anticipated of all the RC racing events, and the manufacturers know they have a lot riding on how well their products perform. Everyone

brings his best. At the 2003 Worlds, the classes were split when Losi and Associated each won one of the two classes. Things are definitely heating up there.

The ESC battle was also a draw with Novak and LRP each taking a class, and it was the

same with motors: Trinity and Reedy split the two classes. It was again the same for the batteries: Trinity cells and Reedy cells each powered a winner.

Congratulations to Ryan Cavalieri and Billy Easton on their impressive and very

hard-fought victories, and congratulations to the Minnreg crew for pulling off such a fantastic and well-run event. If you are ever in Tampa, FL, or anywhere in Florida for that matter, work in a trip to the Minnreg RC Club over in Largo; it's worth it. ■

THE WORLD'S FASTEST!

IFMAR 4WD WORLD CHAMPION

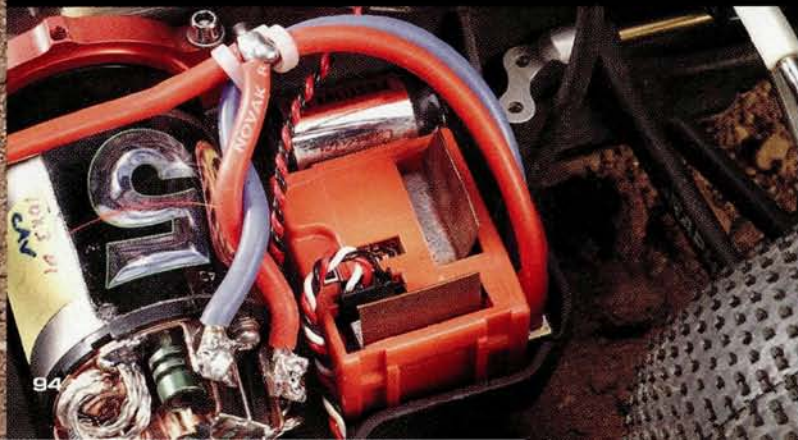
Matt Francis TO'd the four-wheel class at the last Worlds with a prototype Triple-X4, and Jukka Steenari took the win with a Double-X4, but this year it was all about the Triple-X4. Not only did Ryan Cavalieri win the whole show, but nine of the 10 cars in the A-main were Team Losi Triple-X4s—the Graphite Plus version, to be exact. The graphite car already has just about all the factory upgrades, so Ryan's winning ride is close to stock. But there are still some tricks you can learn!

RYAN CAVALIERI'S TRINITY-POWERED TEAM LOSI TRIPLE-X4 GRAPHITE PLUS

Setup	Front	Rear
Caster/anti-squat	7.5 deg.	3 deg.
Camber	-1 deg.	-1 deg.
Toe	1 deg. out	2 deg. in
Ride height	Dogbones level	Dogbones just above level
Bump-steer spacers	None	-
Ackerman	Back	-
Camber-link position (inner/outer)	1/-	2/A
Camber-link roll-center spacers	None	-
Shock fluid	30WT	30WT
Shock piston	No. 57	No. 56
Shock springs	Green	Pink
Internal springs	None	None
Shock limiters	0.090 in.	None
Shock position (upper/lower)	2/inside	2/inside
Pivot support (F/R)	7.5	3
Differentials	One-way	plastic w/Trinity sleeve
Rear-hub spacing	-	Forward
Battery placement	-	Rear
Swaybar	None	0.055 in.

Ryan ran an experimental Novak ESC at the Worlds. According to Novak, it's a test bed for new features, not a prototype for a new ESC. Rest assured, you will never see those heat sinks on a production ESC!

The front axles' dogbones are equipped with tiny ball bearings, and aluminum torque rings prevent the enlarged diff slots from spreading under load. The setup is super-slick; it seems to spin forever. Ryan also uses Losi's optional aluminum pivot supports.





Additional modifications

- > Graphics by Vinyl Graphics Unlimited (814) 226-7887
- > Paint by Renblast Graphics (810) 984-0196; renblastgraphics.com.
- > Team Losi aluminum pivot supports
- > Trinity aluminum rear uprights
- > Anti-scuff film applied to chassis' underside
- > Front arms are standard plastic, not graphite, for extra flexibility
- > Rear arms have been swapped right to left
- > Custom ball-bearing front outrdrives

Electronics

- > Transmitter Airtronics M8
- > Servo Airtronics 94552
- > Battery pack Epic VIS GP3300
- > Tires Pro-Line Holeshots (spec tires)
- > Inserts Stock
- > Body Team Losi Aurora
- > Receiver Airtronics 92836
- > ESC Novak experimental
- > Motor Trinity D5 10x3
- > Gearing 92/18

To trim a few grams off the drive train, Ryan swapped the steel, rear diff outrdrives for plastic and added Trinity sleeves. The swaybar is standard on the X4 Graphite Plus.

Ryan left the stock steering-linkage hole unused in favor of a custom position at the center of the drag bar. He says that this mod makes the steering more consistent.



QUESTIONS

**RYAN CAVALIERI, 4WD ELECTRIC
OFF-ROAD WORLD CHAMPION**

AGE: 17

FROM: Huntington Beach, CA

HOME TRACK: SoCal RC Raceway

SPONSORS: Trinity, Team Losi, Novak, Airtronics, MIP,
Lunsford, Titan Tech, Renblast Paints, Vinyl Graphics

1. WHAT DO YOU LIKE BEST ABOUT RC RACING? I really like the competition and how exciting it is, but I also like being around the people. I have a lot of friends at the track, and we always have fun.

2. WHAT GOT YOU INTO RC? Well, my dad started RC racing when I was four, and then he got out of it for a bit. He started back up when I was 10. He was racing at SoCal, and I got into it then.

3. WHO DID YOU CALL FIRST AFTER WINNING THE WORLDS? My mom; she knows how much this means to me, and I called her right away.

4. WHO GAVE YOU THE NICKNAME "PUDDGE"? That was Thunder Wessels; he was the first person to call me Pudge. I don't know why he did that.

5. IF YOU COULD RACE IN ONLY ONE CLASS, WHICH WOULD THAT BE? It would have to be 2WD buggy because it's so competitive and so fast. That's what everyone runs at SoCal, and it's the hardest class to win.

6. WHAT DO YOU SPEND THE MOST TIME TUNING WHEN YOU WORK ON YOUR CARS? I actually hardly ever change my setup. I just get used to the car. I might change tires, if anything, but I have a setup and stick to it. I do sometimes dial out some steering. My cars always seem to have too much steering, but for the most part, when I go to a new track, I don't mess with my setup; I just practice and get used to how the car is handling.

7. WHAT DO YOU THINK YOUR FUTURE IN RC IS? I'm just going to keep doing it. Basically, I'm going to keep racing until I can't race anymore. I'm having a lot of fun racing right now and can't see myself stopping.

8. WHAT WERE YOUR EXPECTATIONS GOING INTO THE WORLDS? A lot of people were talking about how I was going to win, but I didn't know. I really thought I could win 2WD, but as it turns out, I did very badly in that class. Going to the Worlds, I didn't expect to do well in 4WD because I have such bad luck in that class, but I ended up winning. I never do well in four-wheel; I usually break or get broken.

9. WHAT'S YOUR BIGGEST PET PEEVE AT THE TRACK? I can't stand people who lean over the drivers' stand so you can't see your car in some parts of the track.

10. WHAT'S YOUR FAVORITE SPORT? I'd have to go with basketball.

11. WHICH CD DO YOU PLAY THE MOST RIGHT NOW? Right now, I listen mostly to 50 Cent and some Eminem, too.

12. IF YOU COULD HAVE ANY CAR IN THE WORLD, WHAT WOULD THAT BE? I don't drive yet, but it would have to be a Ferrari.

13. WHAT'S THE COOLEST PLACE YOU'VE EVER BEEN? Hawaii. I went there with Andy Swanson. The weather and water were perfect.

14. WHAT'S THE WORST PLACE YOU'VE EVER BEEN? Missouri is the only place that I can think of where I've had a bad time. I have nothing against Missouri, but when I went there, it was so hot. It was hot all the time. Night and day, it was hot. It was my first gas race, and everything went wrong, and it was so hard to work on stuff in the heat.

15. WHAT'S YOUR FAVORITE TV SHOW? "The Simpsons." Homer is my favorite character; he's a riot.

16. WHAT'S YOUR FAVORITE MOVIE? I love "Ace Ventura." That's the funniest movie ever.

17. WHERE DO YOU GO TO SCHOOL? I'm actually home-schooled right now. This is my second year; for me, it's so much easier.

18. WHERE CAN YOU BE FOUND ON A TYPICAL FRIDAY NIGHT? I race on Friday nights, but if I'm not racing, I can be found hanging out at the mall with other racers like Joe Pillars. Sometimes, we catch a movie. A lot of the racers hang out together.

19. DO YOU WORK RIGHT NOW? No, I just race. I go to the track every day and run through all my packs. I spend most of my time racing and practicing.

20. WHERE WILL WE SEE YOU NEXT? I'm getting ready right now to head out for Arizona for a big race at Competition Hobbies, but from there, who knows?

Thanks for your time Ryan and congratulations again on your latest World Championship.

IFMAR 2WD WORLD CHAMPION

Poor Billy. Apparently, no one told him that as a pro driver, he's entitled to have a one-of-a-kind, tricked-out, factory-works car. With the exception of Factory Team turnbuckles and Unobtainium shock shafts, Billy's car is completely off the shelf. Granted, it's meticulously built, and some skill is required to win the IFMAR Worlds, but if you want to own a car that can beat the best,

It's just a trip to the hobby shop away.

BILLY EASTON'S REEDY-POWERED ASSOCIATED RC10 B4 STEALTH



Billy's B4 carries the next-generation LRP Phazer receiver. According to LRP, the Phazer Competition automatically senses the high frame rates used by the latest Futaba, KO and JR radios and sets itself accordingly.

Billy's car is so stock that this bit of lead weight could be called a "major modification." When you're a pro of Billy's caliber, you can feel every gram.



Additional modifications

- > Reedy Quasar motor brushes and standard springs
- > Drag brake and initial brake set at "2"
- > Factory Team Unobtanium shock shafts
- > Front-shock eyelets unthreaded one rotation
- > 1/2-inch vertical air dam on wing
- > 1/4-ounce added to the chassis' rear on each side of the battery tray
- > Anti-scuff film applied to chassis' underside

Electronics

- > **Transmitter** Airtronics M8
- > **Servo** Airtronics 94358
- > **Battery pack** Reedy/Yokomo 3300 X-Cell
- > **Tires** (F/R) Team Losi A-7206/Team
- > **Losi A-7369 X-2000 Red** (spec tire)
- > **Inserts** Stock Losi
- > **Body** Pro-Line Crowd Pleazer
- > **Receiver** LRP Phazer Competition
- > **ESC** LRP Quantum Competition 2
- > **Motor** Reedy Kr Modified, 14x2
- > **Gearing** 23/78



Setup

	Front	Rear
Caster/anti-squat	30 deg.	2 deg.
Camber setting	-1 deg.	-0.5 deg.
Toe	Zero	3 deg. in.
Ride height	Arms level	Bones above level
Bump-steer spacers	0.030 in.	-
Steering block	Trailing	-
Ackerman	Rear position	-
Spindle height	Up	-
Camber link position (inner/outer)	1/A	1/B
Camber link roll-center spacers	0.030 in.	0.060 in.
Shock fluid	35WT	25WT
Shock piston	1	2
Shock springs	Brown	Silver
Shock limiters	0	3
Shock position (upper/lower)	2/outer	1/inner
Rear-hub spacing	-	Forward
Battery placement	-	Rear
Swaybar	None	None
Wing angle	-	6 deg.

Both Billy and Ryan used Factory Team adhesive Mylar to prevent the screw heads from packing with dirt and to prevent wear on the chassis' bottom.

With the exception of Factory Team turnbuckles and Unobtanium shock shafts, this B4 front end is totally stock. Look for these parts in a Factory Team B4 soon.



QUESTIONS

**BILLY EASTON, 2WD ELECTRIC
OFF-ROAD WORLD CHAMPION**

AGE: 26

FROM: Fullerton, CA

HOME TRACK: SoCal RC Raceway

SPONSORS: Reedy, Team Associated,
Pro-Line, Yokomo, LRP, Airtronics, MIP,
Kimbrough, Testors, IRS

1. WHO DID YOU CALL FIRST AFTER WINNING THE

WORLDS? My dad, but I was so glad Gene Husting was there. In the RC world, he's the most important to me. When I was just starting, he believed in me, and he's my motivation today. He's been there since I was a little kid. I owe everything to him, and I was really just so glad to share the experience with him. He's a truly great person. He's like a second father to me.

2. YOU'VE BEEN AROUND THE HOBBY A WHILE. WHAT DO YOU THINK THE FUTURE OF RC IS?

There will always be racing. It's going to get more competitive. These cars have changed so much that a lot more guys can go fast now. Back in the day, you had to be really, really good to go fast. These new cars just make it so easy.

3. WHAT ARE YOU MOST PROUD OF? The Worlds. All my hard work came together. It wasn't as if I had a good car but drove badly or had a great car but sucked at driving. You get wins sometimes that way—just by luck. I didn't get lucky. No one handed this one to me. All my practice and preparation paid off.

4. ON THE OTHER SIDE OF THE COIN, IF YOU COULD TAKE BACK ONE THING YOU'VE DONE IN YOUR LIFE, WHAT WOULD THAT BE?

Oh, I've made my fair share of mistakes. Sometimes, I regret not going straight to college right after high school, but then I wouldn't be where I am now. I've learned so much being in this business. I'm talking about stuff I wouldn't have learned in school—real-life lessons.

5. WHAT'S YOUR FAVORITE SPORT? I like hitting baseballs. If I could do that as a sport, I would.

6. WHICH KIND OF MUSIC DO YOU LIKE?

All kinds really. I like alternative and even a little R&B. I like rap but nothing too hardcore. I've even listened to some country on the radio. I like anything with a good beat and tune. Just about anything, as long as it's not too crazy.

7. WHAT ARE SOME OF YOUR FAVORITE BANDS?

Coldplay and Dave Matthews. That's music you can just relax to.

8. WHO'S THE HOTTEST GIRL ON THE PLANET? I can't really think of a girl I think is the hottest. I see beautiful women every day that I'd love to be with.

9. SEEING ANYONE? I'm single and looking. I could use a good woman. Know anyone?

10. I'LL SEE WHAT WE CAN DO. IF YOU COULD HAVE ANY CAR IN THE WORLD, WHAT WOULD THAT BE? A McLaren or a Ferrari; I bet I could get some women with one of those!

11. WHAT'S THE COOLEST PLACE YOU'VE EVER BEEN? Madrid, Spain. That place was just so cool.

12. WHAT DID YOU LIKE ABOUT IT? The nightlife was incredible. They party to six in the morning. We went to one club that had this huge 3D light show that was so cool I couldn't even begin to describe it. I'd love to see it again. It was simply amazing.

13. WHAT WOULD YOU DO IF THE BANK PUT AN EXTRA GRAND IN YOUR ACCOUNT BY ACCIDENT? I'd just tell them. It would be my luck that they'd find out and want it back after I had spent it. That would suck.

14. WHAT'S YOUR FAVORITE TV SHOW? I don't watch TV. As a matter of fact, I don't even own a TV. I have no use for one.

15. YOU OBVIOUSLY DON'T CARE TOO MUCH FOR WHAT'S ON THE BOOB TUBE; DO YOU HAVE A FAVORITE MOVIE? All of the Matrix movies. I could watch them over and over again. They entertain my mind.

16. WHAT'S THE COOLEST THING YOU'VE EVER DONE IN YOUR LIFE? I don't even know. I'm pretty boring, I guess. I think it's cool to just hang out with my friends from the track.

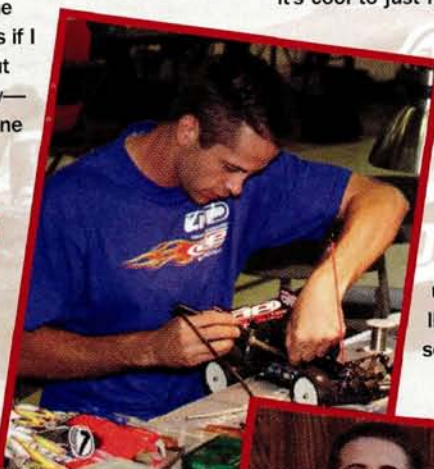
17. WHERE CAN YOU BE FOUND ON A TYPICAL FRIDAY NIGHT? If I do go out, it's to Dave and Busters. It's got a bar and arcade. There's all sorts of games like pool. It's a cool place to hang out.

18. IS THERE SOMETHING ABOUT YOU THAT NO ONE ELSE KNOWS ABOUT? That I'm really honest. I think that sometimes, people misunderstand me or even get mad because I just tell it like it is. I take pride in how honest I am, and maybe sometimes I don't sugarcoat things, but I'm always honest.

19. WHAT'S THE WORST JOB YOU'VE EVER HAD? Digging ditches. I had this job digging ditches for my dad. That sucked.

20. WHAT'S YOUR NEXT BIG RACE? I want to see if I can go to Cleveland. I won that about three years ago and still feel like I'm driving as well as I did back then. I'd like to go back and try to win that one again; after that, the Snowbirds.

Billy, it was real pleasure talking with you. Congratulations again on your victory at the Worlds. You have a lot to be proud of with that big win.

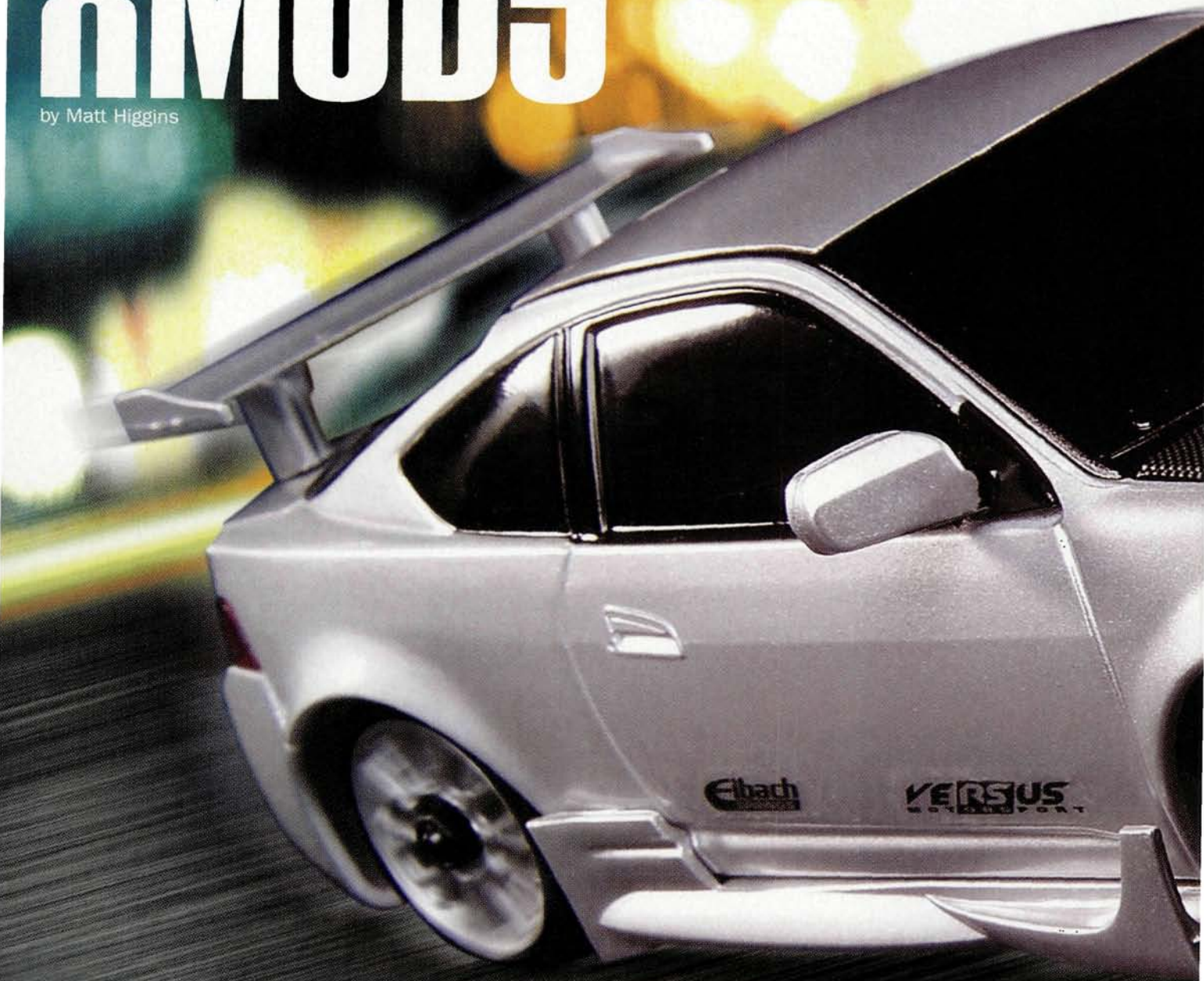


firstdrive >>>

RadioShack

XMODS

by Matt Higgins



The 'Shack's surprise

FOR YEARS, SERIOUS RC ENTHUSIASTS and even the casual hobbyists have pretty much snubbed RadioShack and dismissed its RC line as just toys. Now, the 'Shack has a new line that simply shatters that stereotype; it's the new XMODS line of ready-to-run $\frac{1}{28}$ -scale cars, and they are as "real" as anything else in their class. These little wonders feature 4-wheel independent suspension, a fully adjustable transmitter and, best of all, a completely modular design from the body to the chassis and out to the wheels. Oh, yeah—they cost only 50 bucks! Check it out and get ready to have a new opinion of RadioShack.



This is my XMODS all tricked out. The body kit is really two kits in one because it includes both a mild version and a wild version. I mixed and matched kit pieces to create my own unique look. The pieces for my Acura RSX are replicas of actual Versus body kit components; that many of the XMODS upgrades and the XMODS themselves are licensed products is very cool. Keeping the mods going, I added a set of upgrade rims and soft-compound treaded tires. My XMODS got performance boosting upgrades, too. Out of sight under the shell are the AWD kit, ball bearings and a Stage 2 motor.

JUST LIKE THE REAL DEAL

One of the coolest things about the XMODS is how realistic they are. RadioShack didn't cut corners with these cars; they designed each body style to be an exact 1/28-scale replica of its full-size counterpart. The designs aren't only replicas; they are licensed, and are thus spot on—right down to the tiny brand emblems in the grill.

The cars aren't the only licensed things in the XMODS lineup. The upgrades should do more than just ring a bell with the street tuner crowd; these XMODS body kits are licensed designs from Bomex and Versus. So, if you thought the cars in the "Fast and Furious" movies were hot, then you're sure to dig these body kits, as these were the manufacturers of choice for the filmmakers. Legendary street tuner suspension-maker Eibach is onboard for the XMODS as are Ace, Enkei and Tenzo for the dubs. Sparco even provided the design for the replacement steering wheel that comes with the body kits. If you're into the street tuner scene or just like the idea of a modifiable scale car, then the XMODS will be right up your alley.



SPECS

MANUFACTURER RadioShack
MODEL XMODS Acura RSX Starter Kit
PRICE \$50

DIMENSIONS
Wheelbase 3.54 in. (90mm)

WEIGHT
Total, as shown 7.3 oz. (208g)

CHASSIS
Type Molded tub with front and rear upper decks
Material Plastic

DRIVE TRAIN
Type Gear-driven 2WD
Primary 24T spur/8T pinion
Primary gear ratio 3:1
Differentials Gear with steel drive axles
Bearings Plastic bushings

SUSPENSION
Type 4-wheel independent
Shocks Plastic-body, coil-over, friction type

WHEELS
Type One-piece plastic

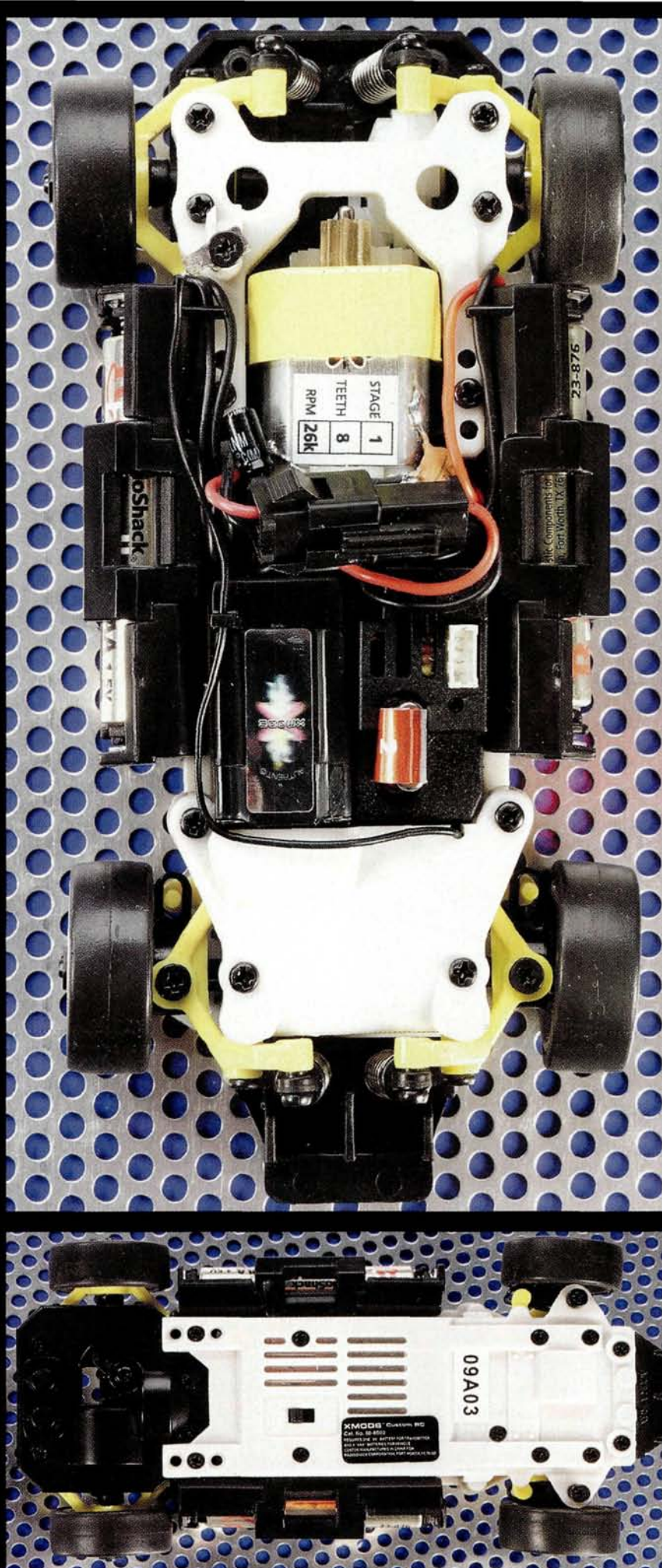
TIRES
Type Rubber slicks

Our test XMODS was the very cool silver Acura RSX. XMODS come in a starter kit; each one features a different body. As a bonus, each different body kit operates on a different frequency. The cars are also licensed designs and are sized exactly to scale. The body types available as of this writing include: yellow 2001 Nissan Skyline GT-R34 V-Spec; silver 2003 Acura RSX; black 2000 Honda Civic Coupe; blue 2000 Honda Civic Coupe; white 1997 Toyota Supra; and red 1997 Toyota Supra.

The transmitter included with the XMODS is a complete surprise just by itself. First, with the push of a button, the transmitter folds in half for easy storage or transport. Second, it also has some pretty cool styling with its streamlined profile and detailed racing-rim steering knob. More important than looks are the standard features that include proportional throttle and steering, digital steering trim and—get this—dual rate. There are more than a few companies that can't claim that their RTRs have dual rate. It's a very welcome feature on the XMODS. The transmitter runs off a single 9V battery, is easily converted to left-hand use and even has interchangeable crystals.

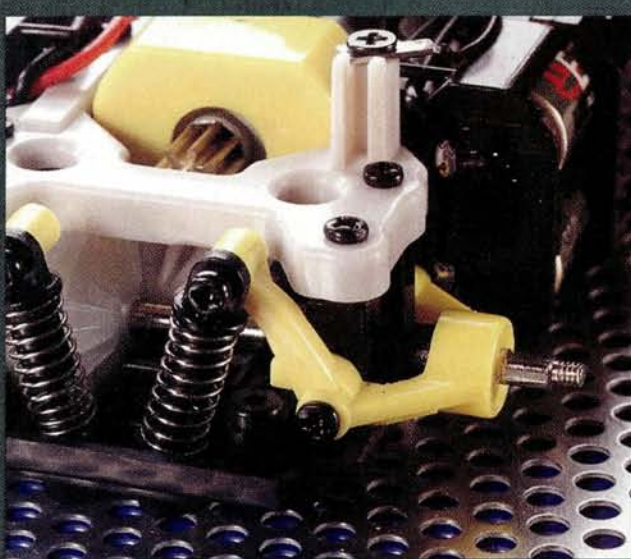


Right: with the XMODS belly-side up, you can see how the body is attached. In front, a tab slides into a slot on the body shell's front-bumper assembly. Out back, the rear of the body has a long clip that snaps into the bottom of the chassis. After the body has been installed, a small tab pivots and locks everything into place.





The front suspension uses a simple, but effective, system. The lower arm is fixed, and the hubs travel up and down as an upper arm manipulates an inboard coil-over shock. The shocks are mounted with a small shoulder screw at the upper mounting point, and each one snaps into place on the chassis at the lower point.



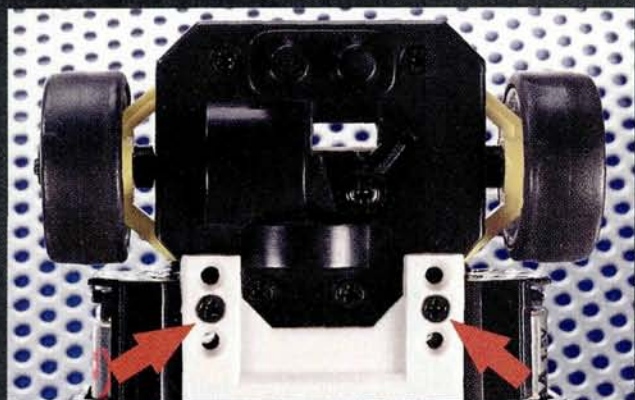
Inboard coil-over shocks are found in the rear, but the rear suspension's single, low-mounted pivot arm allows the wheels to swing up and undergo camber changes as the suspension travels through its range of motion.



On top of the chassis is a replaceable 27MHz receiver crystal, and right next to the crystal is the port for the optional light kit. Also, next to the crystal and underneath the silver, holographic XMODS sticker is the servo mechanism. The XMODS, like other RC cars in its class, uses a modular electronics setup that doesn't allow individual electronic components to be replaced. Each body style operates on a different frequency, and a crystal set is available that will allow 12 XMODS to race at the same time.



The XMODS is cool even in its packaging that doubles as a carrying case. Here you can see what you'll get when you crack open one of the XMODS starter kits. The transmitter is stored in the folded position, and the chassis sits waiting for the wheels and body to be added. The overall assembly doesn't take too long at all, and all the tools you'll need are included.



The XMODS come in three wheelbases to correspond to the available bodies. Down the road, if you want to switch things up and try out a different shell, it will be a snap—literally. Just find the correct front tab for the body you plan to mount and, if necessary, change the drive shaft's length to match the body. Then remove these two screws (arrowed) and two more from the top of the chassis, and just slide the rear chassis section to the correct length for the body you plan to use. Tighten everything down, and that's it.



Four AAA cells ride saddlebag style to power the XMODS. To access the batteries, the body is easy to separate from the chassis without tools, and then release a clip on each side to remove the batteries. The battery holders can even be moved fore and aft to alter the weight distribution and to change the XMODS' handling. Move the batteries as far forward as possible for more steering and do the opposite for increased rear traction.

THE MANY MODS

The name XMODS is said to come from the fact there are extreme levels of modifications possible for these cars. That's pretty believable considering what is already available. Here's the current lineup of appearance and performance boosters.

- > Graphics and decals set \$6
- > Body kits \$13
- > Stage 1 motor upgrade \$13
- > Racing crystals set \$16
- > Tire upgrade \$8
- > Command Logic lights \$8
- > Tool set \$13
- > Rally touring case \$30



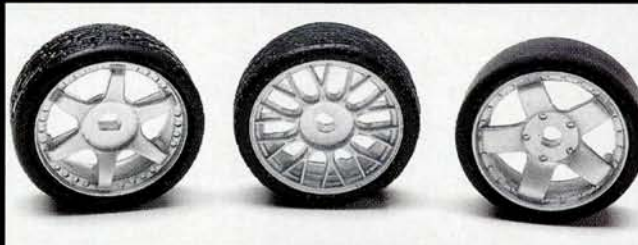
Rechargeable NiMH battery with charger \$25



Suspension and steering upgrade \$8



AWD upgrade \$15



Wheel upgrade \$10



Foam tire and wheel upgrade \$8



Metal bearing upgrade \$20



Stage 2 motor upgrade \$16

WE DRIVE IT!

Getting the XMODS up and going wasn't difficult or time consuming at all. The modular body comes disassembled; you have to install the hood, front and rear bumpers, side rearview mirrors and the side skirts. On some models, you might also have to put some screws into a wing. All these pieces are attached with small screws, and RadioShack includes a small screwdriver for them and a wrench for the wheels that also have to be attached. The receiver antenna is secured with a single screw. After you've finished all that, you only have to install the batteries before hitting the streets.

My XMODS' first shakedown was right here in the office. In stock form, the acceleration wasn't the greatest on carpet, but its top speed of 11.2mph was impressive and is right on par with its 1/28-scale competition. I heard the car bog down slightly on the carpet, and that would explain the not-so-eye-opening takeoff. The handling, however, was great on the office carpet. I could toss the XMODS around, and it demonstrated very responsive steering and predictable handling. When I went full speed and yanked the wheel in one direction, the car would come right around; it never flipped or even got slightly out of shape. On really hard turns I could send the XMODS into a small skid and even hear the spin of differential as it let loose a little—all good fun.



The next test of the XMODS took place at home on hardwood floors. The RadioShack car was simply awesome on this smooth, clean surface. It not only ripped right along, but the XMODS handled like a dream. Acceleration was also notably better on the hard surface, and I felt as if I was driving one of my larger-scale RC racecars right there in the house—only without my wife yelling at me. I quickly set up a makeshift racetrack and had a blast. I really like that the XMODS has both brakes and reverse. Slight use of the brakes every once in a while allowed me to get around my little track pretty fast, and the reverse was great when I got going a little too fast and drove the car into something.

The last official test of the XMODS was outdoors on a vacant tennis court. Again, the surface was smooth, but the traction was exponentially higher out here on the textured coating of the court. Top speed seemed a little slower, but the handling was even better with gobs of traction at the XMODS' disposal.

Since I got my hands on one of these XMODS, I've tested it just about everywhere I can. It's been run on wood floors, carpet, pavement, tile and athletic courts, and it's unfortunately been run full speed into wooden furniture and more than a few more formidable foes—such as walls. On each surface it ran well, even in stock form, and after each collision the XMODS came away unfazed except for a few scratches.

SOURCES

XMODS distributed by RadioShack (800) THESHACK; xmodsrc.com.

XTM Racing Mammoth



XTM ENTERED THE MONSTER TRUCK ARENA nearly one year ago with the X-Factor, and without losing any momentum, it has released yet another giant flatbed: the Mammoth. Unlike the X, the Mammoth features independent suspension instead of a solid axle, and it also exudes a more race-like vibe. This big truck comes RTR with XTM's very powerful 24-7 engine, tuned pipe, 2-speed tranny, 8 shocks, full ball bearings and a claimed top speed of 50mph. Can this giant monster live up to the claim and also perform like a race truck?

52 mph



monster

KIT FEATURES

CHASSIS. The chassis layout is straightforward and has plenty of room when you need to wrench on it. A 3mm, blue, anodized-aluminum plate with radiused sides gives the Mammoth its strength and acts as a platform for all its components. Steel turnbuckles fitted with heavy-duty ball ends brace the front and rear gearboxes. As you look over the chassis, you can clearly see the use of thread-lock on the fasteners that screw into metal. This truck will stay together.

A small aluminum upper deck on the chassis' right side is home to the steering and throttle servos and the radio box that holds the receiver and its battery pack. Cutouts in the chassis plate allow the diffs and the 2-speed to be mounted as low as possible. The diffs are enclosed but the 2-speed isn't; XTM installed a plastic guard to keep the 2-speed safe and sound.

DRIVE TRAIN. The 4WD drive train utilizes a center-mounted 2-speed tranny that helps to give the Mammoth highway-worthy speeds. The drive-dog-style tranny is easily adjusted via hex-head screws, so you can make the second gear engage early or late. A triple-brake system is employed to slow this ballistic monster. Padded-steel calipers clamp the vented-steel brakes. Two discs are mounted on the front outdrive and one on the rear outdrive. Steel dogbones send power to the front and rear sealed planetary gear diffs and universal axles spin the front wheels while dogbones are spec'd for the rear. The entire driveline spins on rubber-shielded ball bearings for a nearly friction-free tranny.

ENGINE AND ACCESSORIES. XTM's reliable and very powerful 24-7 engine is the heart of the Mammoth and makes this giant truck a rocket. It features a .247ci displacement, ABC construction, a 9-fin cooling head and a dual-needle slide carb. What does all this translate into? How about a claimed output of 2.6hp. That is a ton of power. Adding to this is a round-port manifold and an aluminum tuned pipe that escorts the exhaust away from the engine and improves its power. A buggy-type foam filter that keeps the engine breathing clean air is attached to the carb. A 125cc primer-less fuel tank rests just ahead of the engine, and it's fitted with an internal, stone-type filter to prevent contaminants from reaching the carb. I would like a bigger fuel tank for the Mammoth to gain run time, especially since there is plenty of room on the expansive chassis plate.

SUSPENSION AND STEERING. Beefy dual bellcranks with an aluminum drag link, steel turnbuckles and aluminum steering knuckles create a solid steering system. To avoid damaging the steering servo during crashes, a servo-saver is built into the right turnbuckle and is easily adjusted with a thumbscrew.

The Mammoth's suspension setup is fairly standard for a monster truck. Eight threaded-body aluminum shocks with stiff orange springs and heavy shock fluid are used to damp the big flatbed. Shock preload can be adjusted simply with the knurled collars on the shock body. At the bottom of each shock shaft is a yellow silicone shock stop that rests on the spring perch. The clever little stops help protect the shocks when they face harsh terrain. The upper camber links encircle the shocks and are adjusted with steel turnbuckles. The upper links are fairly flexible and should have adequate give for hard crashes. A wishbone at the front link's end is attached to the C-carrier, and in the rear, a regular link is attached to the hub carrier. Identical lower H-arms are used on the front and rear.

BODY, WHEELS AND TIRES. The multicolor, Dodge-Ram-looking body is screen-printed, trimmed and mounted; all that's left to do is place the pre-cut decals. The body sits nice and low, and it conceals most of the components on the chassis. Large, 6-inch-diameter tires that have a directional swoosh pattern and are internally supported by foam inserts provide the Mammoth's traction. The eye-catching, mesh-type, one-piece plastic wheels are chromed for a mirror-like shine.



INCLUDED ELECTRONICS & ACCESSORIES

HITEC LYNX SPORT TRANSMITTER

Hitec's reliable Lynx Sport was recruited to control the Mammoth. This is Hitec's base-model radio system; it's light on features, but it functioned fine during testing. It has the basic features, throttle and steering trims, servo-reversing, battery indicator lights and charging jack (if you choose to use rechargeable batteries).

and brake duties. It is rated to produce 51 oz.-in. of torque and has a transit time of 0.15 second.

TOOLS

XTM includes some basic tools to help keep your Mammoth in top condition. There is a box wrench, turnbuckle wrench and a set of hex wrenches that will fit all the hex heads on the chassis.

XTM X-175 MGHP TORQUE PUNISHER SX STEERING SERVO

The new, high-torque X-175 from XTM is designed with trucks like the Mammoth in mind. It produces an incredible 175 oz.-in. of torque at 4.8 volts to turn its big tires and has a transit time of 0.20 second. Metal gears and ball bearings support this powerful servo. XTM tells us that it can be purchased separately for only \$35.

HITEC HS-311 THROTTLE SERVO

The HS-311 is Hitec's standard servo and is well-suited to throttle

you'll need

- Nitro fuel
- Nitro fuel bottle
- Glow igniter
- 12 AA batteries

factory options*

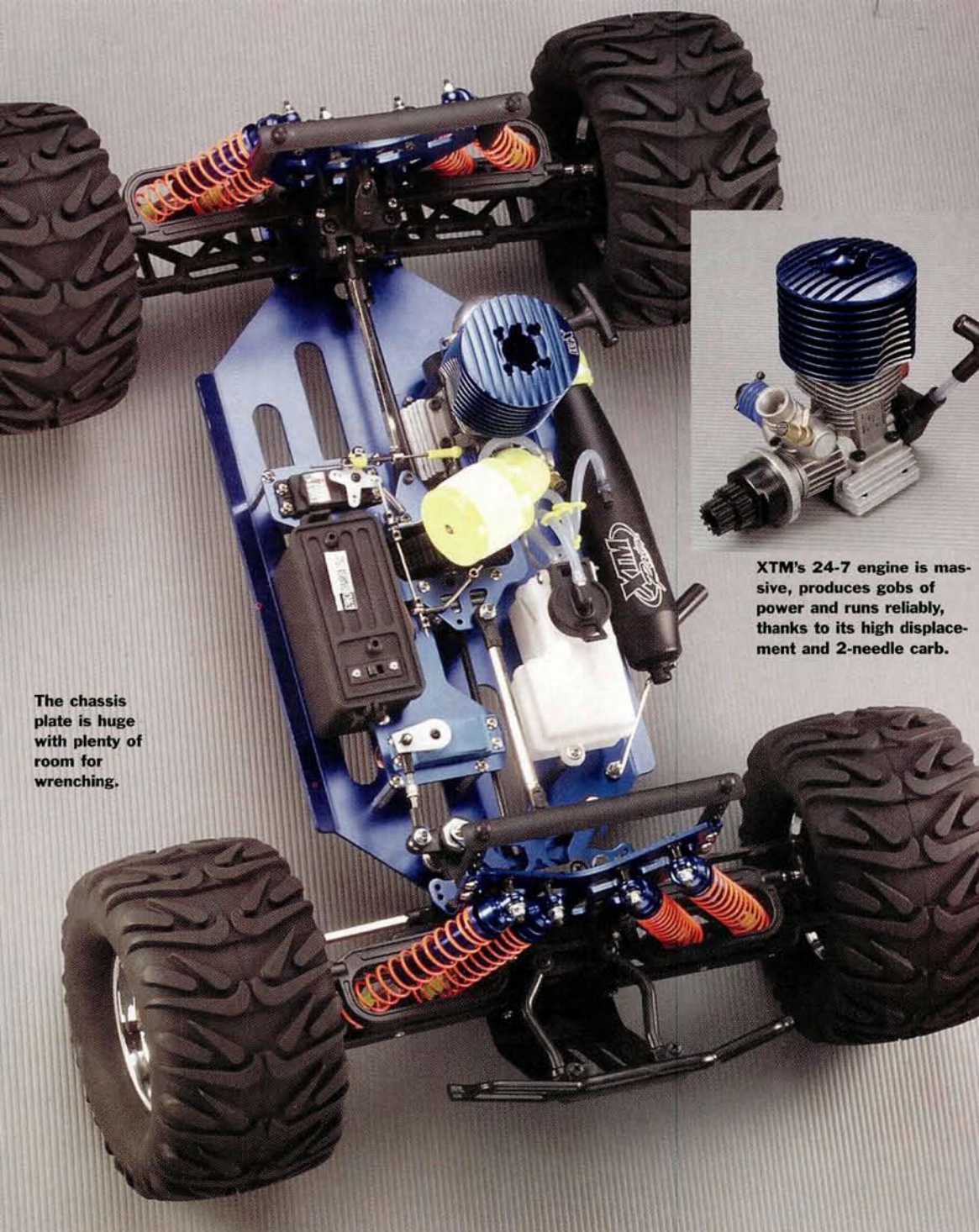
- Aluminum diff case—item no. SEM2287
- Aluminum rear hub (blue)—SEM3461B
- Aluminum front hub carriers (blue)—SEM3481B
- Steel inner diff gears—MV2286
- Tuned pipe (blue)—MV376B

*Partial list; additional option parts available

THE COMPETITION

	ENGINE	PIPE	REVERSE	BRAKES	STARTER	SHOCKS	WHEELBASE	RADIO	PRICE*	REVIEWED
Associated Monster GT	.21	Aluminum	Yes	Single disc	Pull/shaft	8 plastic	14.5 in.	Associated XP3	\$499	12/03
HPI Savage 21	.21	Plastic	No	Single disc	Pull	8 plastic	13.25 in.	HPI TX-2	\$425	3/03
OFNA Titan	.25	Aluminum	No	Dual disc	Pull	8 threaded alum.	13 in.	Airtronics Blazer Sport	\$585	12/02
Tamiya Terra Crusher	.18	Plastic	Yes	Dual disc	Electric	8 plastic	14.1 in.	Tamiya AD Spec	\$385	3/02
Traxxas T-Maxx	.15	Plastic	Yes	Dual disc	Electric	8 plastic	12 in.	Traxxas TQ3	\$406	11/02
XTM Mammoth	.247	Aluminum	No	Triple disc	Pull	8 threaded alum.	15.32 to 15.51 in.	Hitec Lynx Sport	\$400	02/04

*Price varies with dealer



The chassis plate is huge with plenty of room for wrenching.



XTM's 24-7 engine is massive, produces gobs of power and runs reliably, thanks to its high displacement and 2-needle carb.

SPECIFICATIONS

MANUFACTURER XTM Racing
MODEL Mammoth
DISTRIBUTED BY Global Hobby Distributors

SCALE 1/8
PRICE \$400
Varies with dealer

DIMENSIONS
Wheelbase 15.32 to 15.51 in. (389 to 394mm)
Width (F/R) 17.17/17.44 in. (436/443mm)

WEIGHT
Total, as tested 11 lb. 8 oz. (5,216g)

CHASSIS
Type Plate with radiused edges
Material 3mm aluminum

DRIVE TRAIN
Type Shaft-driven 4WD
Primary 14/19T clutch bell; 65/60T spur gears
Transmission ratio 3.31:1
Final drive ratio 15.36:1 (first gear); 10.46:1 (second gear)
Drive shafts (F/R) Universals/dogbones
Differentials Sealed planetary gear
Bearing type Rubber-shielded ball bearings

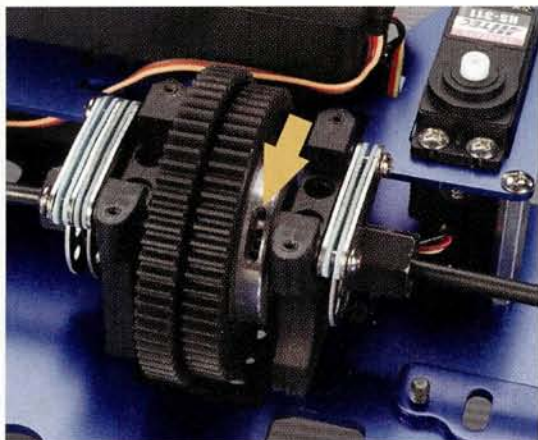
SUSPENSION
Type Lower H-arm with adjustable upper link
Shocks 8, fluid-filled, coil-over threaded, aluminum-body

WHEELS
Type One-piece chromed plastic

TIRES
Type Directional treaded

ENGINE AND ACCESSORIES
Engine XTM 24-7
Carburetor 2-needle slide
Exhaust Round-port manifold with aluminum tuned pipe
Fuel tank 125cc with stone filter

Below: the 2-speed tranny can easily be adjusted by a hex-head screw (arrowed). Check out the three vented disc brakes that gives the Mammoth all its stopping power.



Above: cutouts in the chassis plate allow the differentials and 2-speed tranny to be mounted as low as possible. Note the plastic gear guard that protects the teeth on the spur gears.

Right: long suspension arms, aluminum steering knuckles and beefy turnbuckles combine for a bulletproof package.



PERFORMANCE

In the last stages of the simple break-in for the 24-7 engine, the Mammoth started to reveal its high-speed potential. Quick blips of the throttle made the engine rev up instantly and the massive 4WD moved out like a bullet from a gun. Seeing such a big monster truck flying across a parking lot at speeds that some on-road nitro cars hit is wild. I made a couple of high-speed passes in front of the radar gun and tuned the carb to squeeze out every mph. During the next pass in front of the radar gun, the Mammoth ticked off a 52mph top speed. Unreal! The 2-speed tranny cleanly shifts and propels this giant to highway-like speeds. When topped out, the tires balloon, and that causes the truck to feel unstable, but never to the point at which it felt as if it was out of control. With the triple vented disc brakes, stopping the Mammoth from these speeds was no problem.

Next, I sent the Mammoth off-road to see if it could maneuver as well as it lays down speed runs. I pegged the throttle, and all four wheels broke loose, shooting dirt in their wake. This engine has loads of torque. Thanks to the high-torque steering servo and nimble independent suspension, the truck could easily handle off-road duties. The trucks low, race-like stance means it has a low center of gravity, and its plush suspension keeps it upright. I could not flip this rig easily except when faced with extreme terrain. In the corners, the chassis would lean, but all four wheels stayed grounded. The shocks are relatively soft and can easily soak up ruts without causing the truck to get too out of shape. In dry, dusty areas, the tires push in the corners, and if you are not easy with throttle input, the truck will quickly loop out. On damp surfaces, the tires work well at finding traction, and high-speed cornering is more predictable.

Jumping the XTM Mammoth was easy, and it reacted like an 1/8-scale buggy with flat launches and landings. If the jump was too large, the soft suspension bottomed out, and the truck would hit hard. If your terrain and driving style don't suit the stock settings, the shocks can be adjusted by varying the shock fluid and springs and/or by moving the shock preload collar. Through a full day of off-road pounding, the Mammoth held up very well, and as long as you keep it on all fours, you'll have a hard time breaking it. Just be careful of high-speed rollovers or landing the truck vertically nose or tail first. The large shock towers can bow in that type of crash. If it happens to you, just bend the towers back with a pair of pliers. The engine ran perfectly throughout testing; I wish more engines ran like the 24-7.

THE VERDICT

Overall, I am impressed with XTM's Mammoth monster truck. It comes out of the box needing only decals, batteries and fuel; it performs well and didn't break. The very powerful and reliable 24-7 engine mated with a 2-speed tranny and low-slung chassis made it a blast to drive. It can maneuver in the corners, and on the straightaways, you can tap into its awesome 52mph top speed to dust your opponents. Keep your eyes open because this truck will surely find its way to tracks everywhere.



LIKES

- > Excellent acceleration and incredible top speed.
- > Reliable engine.
- > High-torque steering servo.

DISLIKES

- > Fuel tank is small.
- > Shock towers could be beefier.

TEST GEAR



Byron Race 2000 fuel

Byron's Race fuel has helped many cars find their way onto the podium, and it was used throughout the testing of the Mammoth. Race 2000 has 20% nitro with a 12% blend of castor and synthetic oils to keep the engine well-lubricated. Byron claims that your engine will run better and cooler with its Race fuel.



Trinity NiMH 5-cell receiver battery pack

XTM includes a 4-cell receiver battery pack holder that will get you running, but I swapped it out for a rechargeable battery pack. Trinity's 5-cell NiMH pack will save you money in the long run and will also send full power to the servos for a longer duration than alkalines will.

RATING THE XTM RACING MAMMOTH

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
INSTRUCTIONS	The manual is well thought out and easy to follow.				
INCLUDED ELECTRONICS	The super-strong steering servo is a big plus, but it would be nice to have a transmitter with dual rate.				
PARTS FIT AND FINISH	The truck came from of the box without any trouble spots.				
ACCELERATION	The power of the XTM 24-7 is awesome and gets the big flatbed moved out in a hurry.				
CORNERING ABILITY	The Mammoth can maneuver well for its size.				
BUMP & JUMP HANDLING	The soft suspension soaks up rutted terrain easily, but hard landings can bottom the suspension.				
DURABILITY	There was no breakage to report, but the shock tower was bent in a mild rollover.				

RADAR TESTED TOP SPEED 52MPH*

BEST BUYER Any nitro monster truck fan who likes sick speed.

*Top speed varies with operating conditions.

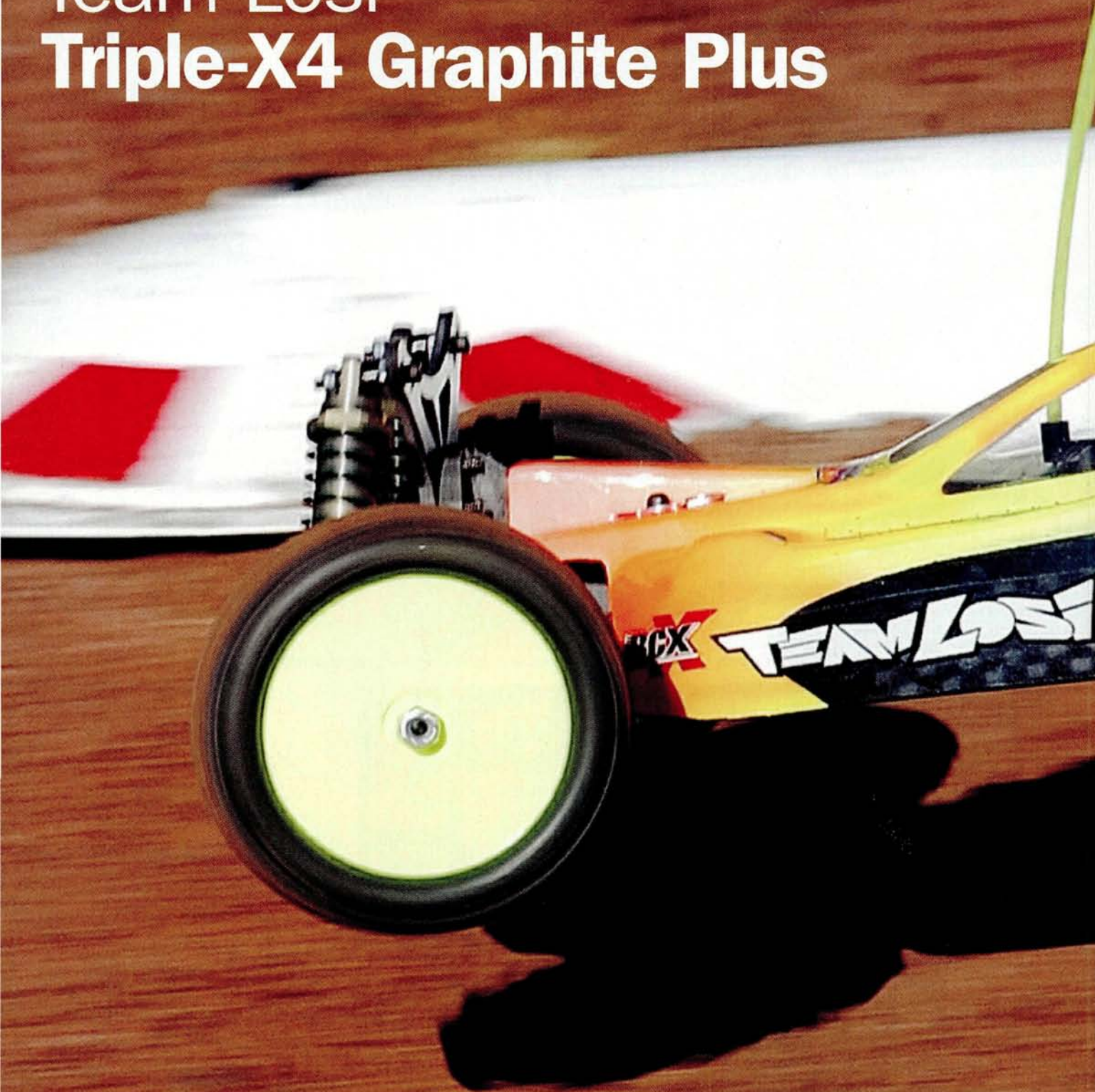
SOURCES

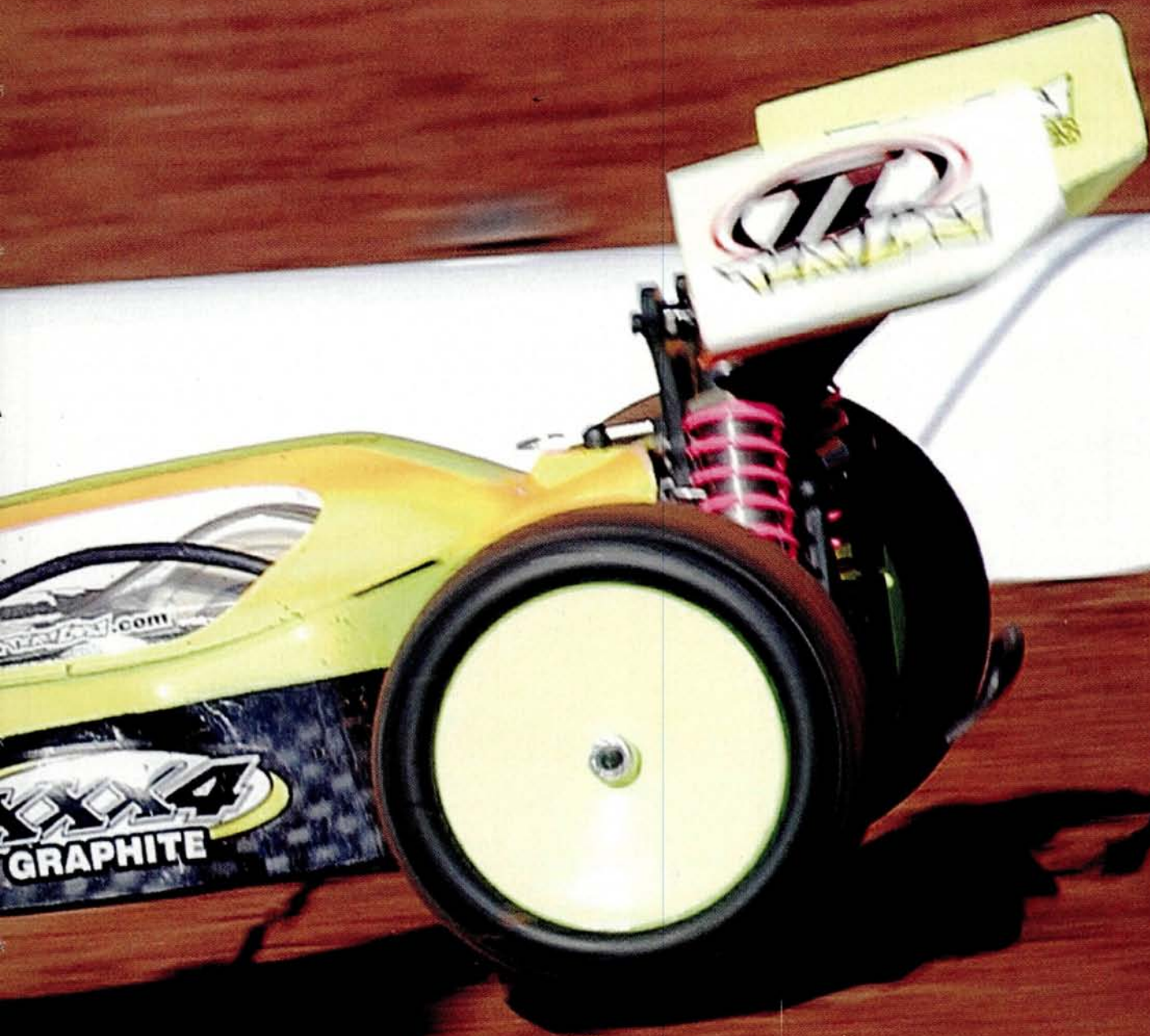
BYRON ORIGINALS (712) 364-3165; byronfuels.com.

TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.

XTM RACING distributed by Global Hobby Distributors (714) 964-0827; xtm.globalhobby.com.

Team Losi Triple-X4 Graphite Plus





FOR SALE WORLD CHAMPIONSHIP FOUR-WHEELER!

WHEN TEAM LOSI COMES OUT WITH A NEW RACECAR, it's always a big hit. But for every guy who books down to the hobby shop the second the latest Losi hits the shelves, there's another guy who holds back and saves a few extra bucks in anticipation of the "Graphite Plus" version. For considerably less than the cost of "modding" a stock machine, the Graphite option gives you all of Team Losi's most important upgrade goodies in one box. The Triple-X4 is the latest rig to get the treatment, and it's already the IFMAR 4WD World Champion. So, are you the guy who has been biding his time, waiting for the Triple-X4 to go graphite? Tap that bank account, 'cause your ride is here.

KIT FEATURES

CHASSIS. No changes to the original Triple-X4 chassis here; it's all about the material. Molded graphite replaces the "Stiffezel" of the standard kit, and the diff covers and battery strap are made of the stuff as well. That leaves the usual Triple-X4 features in place, including seven battery slots for fore/aft pack placement; an integrated motor mount with aluminum motor plate/mesh adjustment cam; and a fully enclosed belt tunnel. The chassis looks like the Triple-XS tourer's, but as any real racer will tell you, the Triple-X4 is stretched about an inch to give a longer, dirt-friendly wheelbase.



The X4G gets a 92-tooth spur gear like the standard car, but now it's made of Kevlar to run more quietly and resist wear.

DRIVE TRAIN. Team Losi put single-belt drive on the map with the Triple-XS touring car, and the system is put to good use on the X4. For the Graphite version, new additions include a Kevlar spur gear that's stronger and quieter (and makes the term "bulletproof" quite literal) and aluminum front and rear CVDs (the standard kit has steel CVDs). The aluminum CVDs trim 16 grams from the drive train, but their thick 4.5mm shafts should be just as tough as steel. Otherwise, the drive train is standard X4 stuff: large-diameter,

externally adjustable front and rear ball differentials with plastic front out-drives and steel rears; adjustable belt tension; heavy-duty (yet low-friction) drive belt; and a super-slim slipper clutch. Diff access is easy; remove six screws to release the "cap" on the end of the chassis, and the diff is out.

SUSPENSION AND STEERING. Here's where Losi really lays on the trick parts. Let's start with the shocks: they're hard anodized as usual but have threaded bodies for no-clip preload adjustment. And instead of plastic preload collars, you get aluminum collars with O-ring "grabbers." Slick,

scuff-resistant, titanium-nitride shock shafts are standard, too. Graphite arms squeeze the shocks against new shock towers that are routed out of 3/8-inch G-10 fiberglass instead of being molded from plastic. The new towers duplicate the front suspension geometry and slightly alter the rear. The rear shocks are moved to the backs of the arms, and the rear tower is wider and lower than stock. In addition to the extra toughness of graphite, substantial gussets now strengthen the front suspension arms, and in an RC first, all the car's hinge pins have a titanium-nitride coating to ward off wear and keep the suspension parts swinging freely. A rear swaybar is standard, the steering bellcranks have ball bearings, and Lunsford titanium turnbuckles supply the finishing touch. That's a lotta stuff.

BODY, WHEELS AND TIRES. Team Losi has made high-quality racing rubber since forever, and a complete set of Taper Pin buns are standard issue with the X4 Graphite. Dish wheels are standard, and a new body and wing cover the chassis. Losi dubs it the "Aurora," and it has softened edges and a deep scoop to cool the motor more effectively than the Invader's "nostril" arrangement. The wing has lost its faceted look in favor of a traditional (and no doubt more aerodynamically efficient) flat design. Team Losi's own Gary Kyes slung the paint for our tester.

BUILDING & SETUP TIPS

No unwieldy addendum manual here; the X4G gets its own dedicated manual, with the usual Losi CAD line art, full-size hardware references with each step and ample text to describe each step. Follow the manual and you'll put the car together just fine, but pay a little extra attention here:

USE THE SELF-TAPPING

SCREW. Spare the wear and tear on the kit's screws by prethreading the graphite parts with the supplied tapping screw; that's what it's there for. Unfortunately, a tapping screw isn't provided for the 2-56 screws that secure the bottom chassis cover, and the tiny screw heads strip easily. To avoid stripping them, use a tight-fitting .050 hex wrench, and lube the screw threads with the kit's silicone grease.

TENSIONER ARM INSTALLA-

TION. If the screw hole in the tensioner arm doesn't line up with the adjustment slot in the chassis, it's because you didn't seat the tensioner arm fully. The layshaft has to slide all the way into the arm for everything to fit properly.

TURNBUCKLE ASSEMBLY.

This is a good tip for any turnbuckle-equipped car: lube the threads of the turnbuckles. There's nothing more frustrating than trying to adjust a turnbuckle only to have it pop off its ball studs when you twist it.

MOTOR INSTALLATION.

You can line up the pinion and spur gear by trial and error, or just measure it for a perfect fit the first time.

Install the pinion so the distance from the pinion's face to the front of the motor can is 3mm.

DON'T CUT THE GEAR

COVER. Unless you run on swept, rock-hard tracks, don't route the ESC wires under the gear cover. Cutting the cover for wire clearance will let dust enter the belt tunnel.

ANTENNA MOUNT INSTALL.

If your antenna mount doesn't want to plug into the chassis, don't ream the hole because you'll get plastic shavings in the belt tunnel and cut the belt. Instead, shave the antenna mount's boss with an X-Acto. Watch your fingers!

you'll need

- Transmitter and receiver
- Electronic speed control
- Steering servo
- Motor
- Battery
- Pinion gear
- Charger
- Tire glue
- Polycarbonate paint

factory options

- Front one-way assembly—item no. A-3245

ALUMINUM PARTS:

- Front main pin mount
 - > 5 deg.—A-9671
 - > 7.5 deg.—A-9672
 - > 10 deg.—A-9673
- Front one-way assembly—A-3245
- Rear inner pin mounts—A-9676
- Hard-coated suspension balls—AA-9940

THE BIG LIST

It's always fun to add up the "sold separately" cost of the included upgrades versus the cost of a Graphite kit, so here goes.

Item	Item no.	Price
■ Graphite parts		
> Revised front suspension arms	A-9734	\$11.50
> Rear suspension arms	A-9802	\$11.50
> Chassis	A-9919	\$50
> Bottom cover and steering tunnel	A-9895	\$8.75
> Diff covers	A-9896	\$10
> Battery strap	A-9898	\$8.75
> Front and rear pivot mounts	A-9734/A9849	\$18 each
■ Kevlar spur gear/pulley	A-3966	\$4
■ Routed shock tower (F/R)	A-1206/A-2206	\$8.50 each
■ Steering bellcrank ball bearing set	A-6915	\$12
■ Threaded shock bodies (F/R)	A-5054/A-5056	\$20 each
■ Aluminum preload collars	A-5049	\$7
■ Titanium-nitride shock shafts (F/R)	A-5060/A-5064	\$7 each
■ Titanium nitride hinge pins	A-6088/91/94	\$21
■ Titanium turnbuckles	A-2056	\$30
■ Aluminum CVDs (F/R)	A-9967/A-9966	\$33/\$35
■ Rear swaybar	A-4257	\$9
■ Aurora body and wing	A-8047	\$17.50
Total		\$358

Whoa! According to these figures, buying the X4 Graphite's upgrade parts separately would actually cost you more than buying the complete X4 Graphite kit (for about \$330), and you wouldn't even have a complete car! Here's another way to look at it: if you bought the standard X4 for \$270, just adding the Graphite X4's aluminum CVDs would put you over the cost of the Graphite X4 kit, but you'd be missing all the Graphite X4's other features. With all that cool stuff, it's hard to believe the X4G costs just \$60 more than the standard X4.



Here's an original X4 front arm (top) compared with the X4G version. The X4G's arms have additional ribbing to increase durability.

SPECIFICATIONS

MANUFACTURER Team Losi
MODEL Triple-X4 Graphite Plus
DISTRIBUTED BY Horizon Hobby
SCALE 1/10
PRICE \$330
Price varies with dealer

DIMENSIONS

Wheelbase 11.2 in. (284mm)
Width 9.2 in. (233mm)

WEIGHT

Total, as tested 58.8 oz. (1,667g)

CHASSIS

Type Molded semi-tub
Material Graphite/plastic composite

DRIVE TRAIN

Type Single-belt, full-time 4WD
Primary 18T pinion (not included)/92T Kevlar spur gear
Transmission ratio 2.10:1
Final drive ratio 10.71:1
Drive shafts MIP CVDs with aluminum shafts
Differentials Ball type, with plastic front outdrives and steel rears
Bearing type Teflon-sealed ball bearings

SUSPENSION

Type (F/R) Lower H-arm with titanium turnbuckle camber link
Shocks Hard-anodized, threaded-body with titanium-nitride shafts

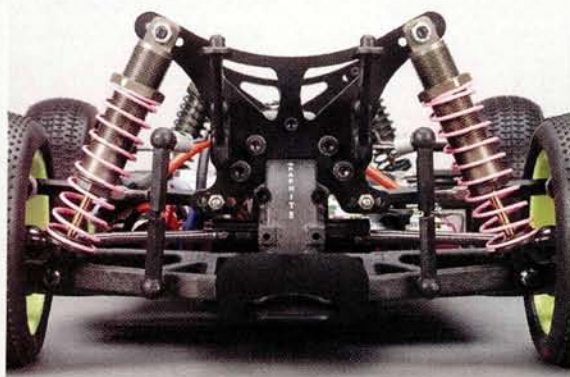
WHEELS

Type Team Losi one-piece dish

TIRES

Type Team Losi Taper Pin, red compound with foam inserts

Below: check out the thick shafts on the MIP CVDs; that's aluminum at work. Titanium turnbuckles are also standard.



Left: threaded-body shocks permit fine preload adjustments, and the aluminum preload collars are much easier to use than the solid plastic versions. The shock placement is new too; the fiberglass tower is lower and wider, and the shocks are now attached behind the suspension arms instead of in front.



PERFORMANCE

I ran the X4G outdoors for action photography, but the actual testing went down at Long Island Raceway in Farmingdale, NY. The indoor dirt track is rock-hard and rocket-fast—exactly the sort of venue the X4G is built for (visit raceway.com to see for yourself). Right from the first pull of the trigger, I could feel the car had piles of grip. That's to be expected from a car with full-time 4WD, but the X4G went above and beyond the usual grab; the freshly Simple Green'd Taper Pins felt as if they were going to suck the track right off the floor. When exiting the last corner before the long back straight, all I had to do was point the front wheels and bury the trigger to unload the Trinity D6 and hurtle the X4G across the track.

The Raceway's layout is very technical; it calls for quick bursts of power to double-single through jumps and for plenty of low-speed steering. I expected the swaybar-equipped rear end to make the car a little loose, but it ripped through the fastest turns and only pushed in the slow sections. Local fast kid Casey Raynes was on the stand next to me, and since he was turning much faster laps, I gave him a turn with the transmitter to get some input from a track regular. He noted the push, too, so I set the front end with zero toe and moved the battery pack forward (I always try the simple stuff first), and Casey gave it the thumbs-up. After a few hot laps, I disabled the rear swaybar, and Casey liked the X4G even better; he noted that it rotated in the turns more easily and had even more low-speed steering. Not bad for about eight seconds worth of tuning!

I also ran into Losi factory pilot James Schlick at the Raceway; he was fresh from the IFMAR Worlds and running his own X4G. James runs his swaybar all the time because it gives him increased forward bite and more on-power steering, and he raved about the new rear-suspension geometry. I could tell that the car felt great through the bumpy sections, but it had been quite a while since I last ran a "regular" Triple-X4, so I didn't have the back-to-back driving experience James did. "It's way better in the bumps and gives the car more sidebite," said James, and I have to agree; my X4G was hooked up.

After I wrapped up my test notes, I cut loose for a few fun laps of jumping and "durability testing." My old X4 would have popped a few front arms after some of the wrecks I put the Graphite car through, but the new front arms are definitely tougher, and the fiberglass shock towers appear crash-proof. Lighter weight and stronger? You don't see that combo too often.

THE VERDICT

Well, this really is a no-brainer. When you can get \$358 worth of upgrade parts for \$60 in a kit that just won the IFMAR 4WD World Championship, then it's gotta be good. The Triple-X4 Graphite is that good. It builds well, drives better, and thanks to all the Graphite goodies, it's more adjustable (and more easily adjusted) than the standard car—not to mention lighter, stronger and better-looking. With a car this good, how can you not wanna race four-wheel? The Triple-X4 Graphite is the perfect excuse to shift your off-road season into all-wheel overdrive.



RATING THE TEAM LOSI TRIPLE-X4 GRAPHITE PLUS

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
INSTRUCTIONS	The presentation isn't lavish, but Losi's no-nonsense instructions make it easy to have a great build.				
PARTS FIT AND FINISH	The X4G's parts fit properly and go together well with only minor exceptions.				
ACCELERATION	Losi's single-belt drive train lets the X4G put the power down like a funny car.				
CORNERING ABILITY	Lots of grip, minimal push and no surprises.				
BUMP & JUMP HANDLING	The X4G is set up for smooth tracks, but you can easily dial in the suspension to suit any track (and bump up this score).				
DURABILITY	Go ahead and crash; the front arms will still be there after your car is marshalled. The X4G is tough.				
RADAR TESTED TOP SPEED	36 MPH*				
BEST BUYER	Racers and all 4WD fans.				

* Top speed varies with equipment used.

LIKES

- > Tremendous bargain compared to hopping up a standard X4.
- > Easy to build, easy to drive and fast from the box.
- > It's the world champ!

DISLIKES

- > Antenna holder was a tight fit (gee, what a major problem).

TEST GEAR



Airtronics MX-3

As good as the Airtronics M8 is, I actually prefer the MX-3. It has all the features any racer needs, with the ergos I prefer. I like the wheel-above-the-thumb setup better than the M8's offset wheel. I didn't need the MX-3 third channel to race the X4G, but if you run 3-channel monster trucks, you'll definitely like the radio's large third-channel switch.

Additional items used to complete the Triple-X4 Graphite Plus

Novak XXtra receiver

Novak GT7 speed control

Trinity D6 10x2 modified motor

Trinity GP3300 VIS-Extra battery

JR Racing Z8550 digital servo

Robinson Racing 18-tooth pinion

SOURCES

AIRTRONICS (714) 978-1895; airtronics.net.

HORIZON HOBBY INC. (800) 338-4639; horizonhobby.com.

JR RACING distributed by Horizon Hobby.

TEAM LOSI distributed by Horizon Hobby Inc.; teamlosi.com.

NOVAK ELECTRONICS INC. (949) 833-8873; teamnovak.com.

TRINITY PRODUCTS INC. (732) 635-1600; teamtrinity.com.

Tamiya F201 Tuned Chassis Kit



Faster



Formula 1

WHEN TAMIYA'S F201 CHASSIS DEBUTED IN FERRARI COLORS IN 2001, it erased all notions of what "Tamiya F1" stood for. Instead of a fiberglass chassis and a pan-car style suspension (and all the limitations of such a design), the F201 had a realistic and functional independent suspension system with bellcrank-actuated shocks just like the real deal. Tamiya also adapted authentic F1 technology to the chassis with its monocoque-like construction, and the F201's ribbed rubber tires could have come straight from the grid at any Grand Prix. Tamiya did deviate from F1 "reality" with a shaft-driven 4WD system, but that was a bonus; it made the F201 handle more like a real F1 car than any of the old solid-axle F-cars ever could. All of this makes the F201 just about irresistible to F1 fans, but if you have managed to resist, get ready to cave. Now that the F201 Tuned Chassis Kit has arrived with its bounty of blue-anodized baubles, there's no way anyone with a longing for open-wheel action will be able to hold back. This is the ultimate F1 car!

KIT FEATURES

CHASSIS. The chassis is one of the few areas that remains stock; you get the standard F201 two-piece, plastic, monocoque-style chassis. It has upper and lower sections that together make up a very rigid package.

The room provided for your electronics is sparse. At the very least, plan to use a small ESC and receiver (a standard-size steering servo will suffice, though). The motor is mounted in line with the car's drive shaft, whereas the battery is mounted perpendicular to the motor. The battery is held in place by a "cup" on each side of the chassis. Simply remove a body clip from one cup, move it out of the way, and then slide the battery out of the chassis' side.

DRIVE TRAIN. The F201 is unique in that it's all-wheel-drive—a power delivery system very unlike its true-world counterparts. Two enclosed ball differentials (front and rear) are connected by a split drive shaft that runs down the chassis' centerline. The drive shafts are split at the spur gear; a long drive shaft is linked to the front diff, and a smaller one shoots out through the spur's back to spin the rear diff. A fluorine-coated, 23-tooth pinion (our first hop-up!) mounted on a 540 Sport Tuned motor spins the 52-tooth spur gear. The motor itself is mounted on a trick, blue, anodized-aluminum motor mount (the second of many hop-ups to come). For completely smooth running, the entire drive train rides on a set of shielded ball bearings.

Once the power gets through the front and rear diffs, the power heads out to the wheels through the drive shafts. The standard F201's drive shafts consisted of round pieces of steel with flattened ends that were captured in slotted cups on each end—not the most efficient design. However, the new Tuned Chassis version comes with much more efficient front and rear universals (more hop-ups) that are far more capable of putting the power down smoothly.

SUSPENSION AND STEERING. The suspension is top-rate on the F201; it uses technology similar to that used on a full-size F1 car. The suspension consists of upper and lower double A-arms with hubs that ride on easily adjustable pivot balls. The suspension arms are secured to the chassis using split pivot balls with tapered flat-head screws. As you tighten the screw, the split pivot ball spreads and allows you to fine-tune the distance between the suspension arms and pivots. The Tuned Chassis kit comes

with a set of resilient, reinforced lower arms (even more hop ... well, you're starting to get the picture).

As for damping, the inboard shocks are actuated by a series of pushrods and cantilevers. As you can see, this F201 version comes with plenty of suspension upgrades. From a racing spring set to aluminum rocker arms to aluminum dampers and new shock pistons, the suspension system has been considerably beefed up.

The F201's steering is handled by a single bellcrank that connects the servo to the wheel hubs directly. The standard kit came with a set of threaded linkage rods, but the tuned chassis comes with a set of adjustable turnbuckles.



Along with a clear body, the Tuned Chassis Kit includes a printed "carbon fiber" shell that is otherwise identical to the included clear Williams body. Nice.

BODY, WHEELS AND TIRES. Since this upgrade is based on a standard Williams FW-24 kit, you receive two bodies: the standard Williams body and a special "carbon-fiber" version (it's printed Lexan) of the same Williams design.

As far as wheels and tires go, once again, you're looking at the same silver 12-spoke OZ wheels and grooved rubber tires as you would find in the Williams package. You even get licensed OZ and Michelin stickers to further replicate the F1 package. Tamiya doesn't overlook even the smallest detail here.

INCLUDED ELECTRONICS. The only electronic part that comes with the F201 is the Sport Tuned 540 motor. The mildly massaged Sport Tuned motor provides decent get-up-and-go, but it will take you only so far so

fast. We've tested previous versions of the F201 with this motor, and for those starting out with this kit, it's a great motor to use to become more familiar with how the car handles.

BUILDING & SETUP TIPS

As usual, Tamiya's instructions are first rate. Although the building process involves a few intricate steps, there's nothing that's too complicated. A few areas require you to pay extra attention such as when you build the suspension arms and match up the front and rear hubs correctly. Other than that, the only difference between building the Tuned Chassis kit and a standard F201 is aluminum hop-ups replace all the standard plastic pieces.

To help you get the F201 dialed out of the box, we turned to Tamiya's ace pilot David Jun for his setup.

DAVID JUNG'S F201 SETUP GUIDE

FRONT SUSPENSION:

Camber: -1 deg.
Toe: 0 deg.
Ride height: 4mm
Pillow-ball gap upper: 4mm
Pillow-ball gap lower: 5mm
Shock length: 58mm
Downtravel: 5mm
Suspension rod length: 49.7mm
Shock fluid: 3000WT w/one black O-ring added above the bladder.
Spring: firm (olive)
Preload clip: none
Rocker arm: aluminum w/2mm spacer on shock side.
Differential: lightweight diff set (very tight)
Notes:

- > Fiberglass stabilizer plate is not used.
- > Pillow-ball gap is the distance between the knuckle arm and the suspension arm.
- > Rod measurements and shock lengths are from end to end and vary depending on assembly.
- > Overall ride height will be higher initially but will settle after shocks have been cycled through driving.
- > Downtravel is measured with the tires removed and the chassis on a tweak board; it's the distance between the board and the bottom of the knuckle arm (set camber before checking downtravel).

REAR SUSPENSION:

Camber: -1 deg.
Toe: 2 deg. in (toe-rod length—51.3mm)
Ride height: 3.5mm
Pillow-ball gap upper: 3.8mm
Pillow-ball gap lower: 5mm
Shock length: 80.7mm
Downtravel: 5mm
Suspension rod length: 48.3mm
Shock fluid: 3000WT
Spring: soft (black)
Preload clip: 3mm
Rocker arm: aluminum w/no spacers
Differential: lightweight diff set (tight, but free)
Notes:

- > Pillow-ball gap is the distance between the knuckle arm and the suspension arm.
- > Rod measurements and shock lengths are from end to end and vary depending on assembly.
- > Overall ride height will be higher initially but will settle after shocks have been cycled through driving.
- > Downtravel is measured with the tires removed and the chassis on a tweak board.

you'll need

- Transmitter and receiver
- Electronic speed control
- 6-cell battery pack
- Steering servo
- Charger
- Tire glue
- Lexan-compatible paint

factory options

- Type A reinforced tire (F/R)—item no. 53564/53565
- Type B reinforced tire (F/R)—53660/53661
- High-speed gear set—53552
- Lightweight counter-gears—53554
- Lightweight differential joint set—53521
- Lightweight differential plate—53563
- Lightweight propeller joint set—53553
- Reinforced propeller shaft—53514

SPECIFICATIONS

MANUFACTURER Tamiya
MODEL F201 Tuned Chassis Kit
DISTRIBUTED BY Tamiya America

SCALE 1/10
PRICE \$415
Varies with dealer

DIMENSIONS
Wheelbase 11.02 in. (280mm)
Width 7.72 in. (196mm)

WEIGHT
Total, as tested 52 oz. (1,474g)

CHASSIS
Type Monocoque
Material Molded plastic

DRIVE TRAIN
Type Shaft-driven 4WD
Primary 2.26:1 (23T pinion/52T spur)
Drive-train ratio 2.6:1
Final drive ratio 5.88:1
Drive shafts (F/R) Universals
Differentials (F/R) Ball type
Bearing type Metal-shielded ball bearings

SUSPENSION
Type (F/R) Double A-arm pivot ball
Shocks Aluminum-body, fluid-filled dampers

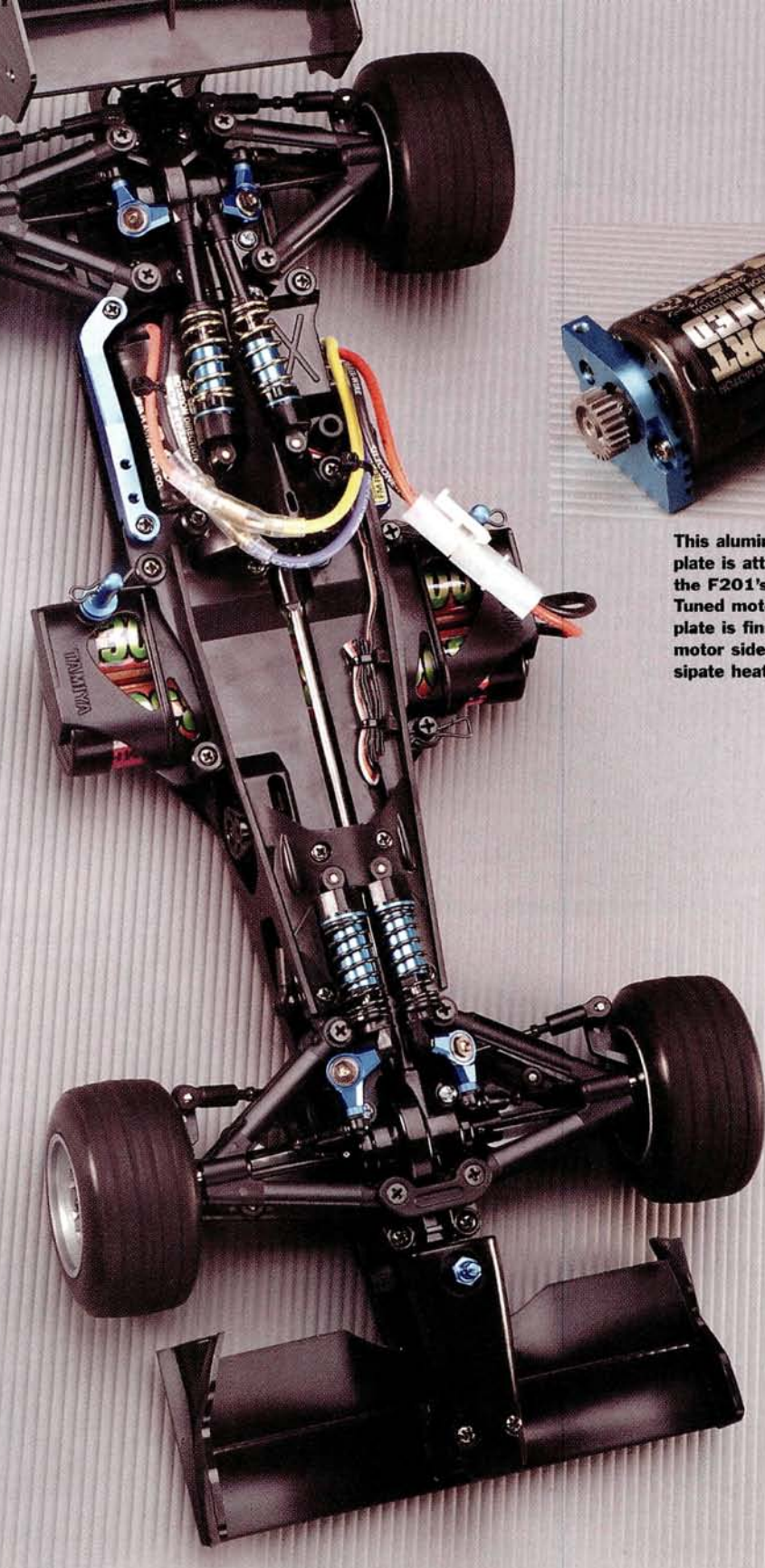
WHEELS
Type One-piece, plastic, 12-spoke OZ-style

TIRES
Grooved F1 rubber

MOTOR
Tamiya Sport Tuned 540

BODY (2 INCLUDED)
Williams F1 clear
Williams F1 carbon fiber

Plenty of blue parts come with the car. An aluminum motor guard and aluminum shocks also come standard with the kit.



This aluminum motor plate is attached to the F201's Sport Tuned motor. The plate is finned on the motor side to help dissipate heat faster.



A set of aluminum rocker arms and aluminum dampers keep the suspension running as smoothly and as solidly as it can be.



WHAT YOU GET

Here's the complete list of the Tuned Chassis Kit's upgrade parts. Keep in mind that this is in addition to a complete, standard F201 chassis kit. You'll have a lot of parts for your spares box!

- > Turnbuckle shaft set—53513; \$6.25
- > Racing spring set—53515; \$5.75
- > Universal shafts (2)—53522; \$30 each
- > Front damper piston—53567; \$7.25
- > Rear damper piston—53568; \$7.25

- > Reinforced lower arms—53637; \$10.50
- > Fluorine-coated 23T pinion—no. not available
- > Williams F1 carbon-print body—no. not available

ALUMINUM PARTS:

- > motor mount—53518; \$16.50
 - > rocker-arm sets (2)—53519; \$34 each
 - > damper cylinders—53566; \$14.50
 - > motor guard (blue)—58518; \$16.50
 - > body mount (blue)—no. not available
- Total value: \$148.50**

PERFORMANCE

The F201 Tuned Chassis kit handles identically to previous versions; with its narrow track, the car exhibits a minor amount of push through the corners, but with its 4WD system, the car feels extremely planted. The only major difference between the Tuned Chassis kit and the original is that with all the upgraded parts, the Tuned Chassis version will still feel as tight after 50 packs as it did after the first one. The aluminum rocker arms in particular will undoubtedly help your machine's suspension work as efficiently as is possible over the long haul.

With that said, there were two performance improvements that we noticed immediately: the upgraded universals are far smoother than the stock kit's dogbones (they don't wobble under acceleration either), and the new gearing (23/52 versus the old gearing's 20/55) gives the car a very marginal increase in top speed. When we hit it with the radar, the F201 had topped out at a little over 23mph.

As far as handling is concerned, driving the F201 Tuned Chassis kit feels more like driving a well-planted touring car than an F1 car. The F201 is a very neutral-handling car, and it goes where you point it without hesitation. When I tried to break it loose on a relatively clean section of asphalt with quick left and right turns on the wheel at high speed, the F201 rapidly darted from side to side. I tried, but I couldn't get the back end to step out. And the car is solid. After all the guys from the office had taken turns behind the wheel, the car was still tight and the drive train was quiet.

THE VERDICT

The F201 quickly became a favorite with Tamiya's F1 crowd. It's easy to drive, and it accurately reflects the scale appearance of an F1 car much better than any of Tamiya's previous endeavors ... well, the Tyrrell P-34 6-wheeler was pretty damn slick-looking ... but when it comes to performance, the F201 can hang with just about anything, thanks to its sure-footed 4WD drive train. A kit with all these hop-ups is a *piece de résistance*. The car may not be for everyone, but if you're a fan of F1 racing action, you need look no further for your RC fix.



LIKES

- > Included option parts make a cool car even cooler.
- > Handles extremely well.
- > Includes clear and "carbon" bodies.

DISLIKES

- > Removing motor for general maintenance is difficult.

TEST GEAR



LRP Quantum Pro Sport ESC

Because of the limited chassis area available for an ESC, the LRP's tiny Quantum Pro Sport ESC was an easy choice. The Pro Sport accepts motors down to 7 turns, has adjustable traction control and weighs just 16.5 grams.

Additional items used to complete the Tamiya F201 Tuned Chassis Kit



Hitec CRX transmitter

LRP Phaser 27MHz receiver

Futaba S9304 coreless servo

Reedy X-Rated 3000 stick pack

RATING THE TAMIYA F201

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
INSTRUCTIONS	Clean and thorough per standards Tamiya set years ago.				
PARTS FIT AND FINISH	Again, Tamiya has set the standard for its parts' quality and fit and finish.				
CORNERING ABILITY	Very neutral, with just a little push.				
ACCELERATION	Decent, but not earth-shattering with the included Sport Tuned motor.				
DURABILITY	No breakage, but the tires wear out rather quickly when you run them on unprepared surfaces.				

RADAR TESTED TOP SPEED 23.4MPH*

BEST BUYER All F1 fans, Tamiya collectors and anyone who appreciates performance and realism.

* Top speed varies with equipment used.

SOURCES

FUTABA distributed exclusively by Great Planes Model Distributors (217) 398-6300; (800) 637-7660; futaba-rc.com.

HITEC RCD INC. (858) 748-6948; hitecrd.com.

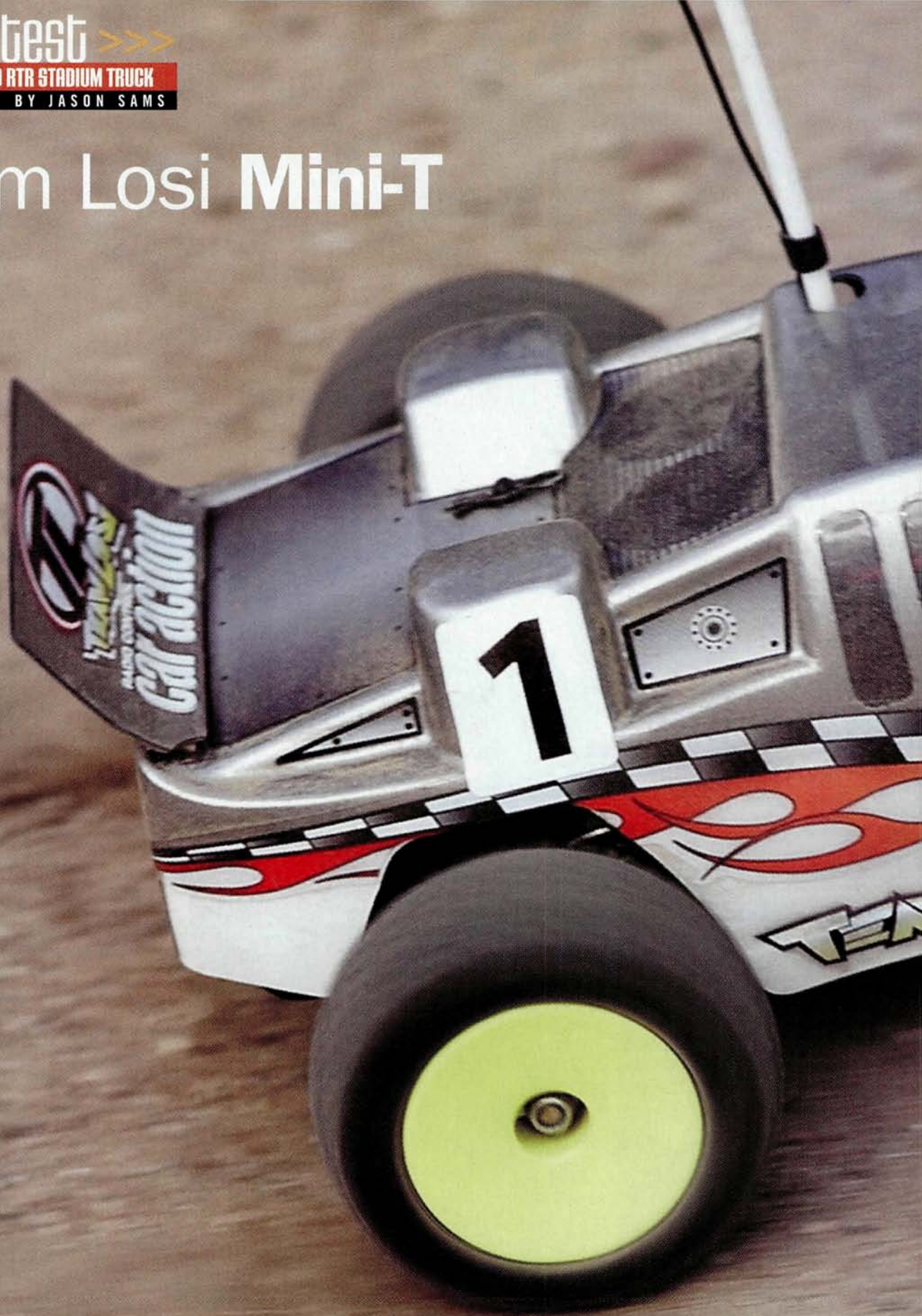
LRP distributed by Team Associated.

REEDY, a division of Team Associated.

TAMIYA AMERICA INC. (949) 362-2240; tamiyausa.com.

TEAM ASSOCIATED (714) 850-9342; teamassociated.com.

Team Losi Mini-T





MINI *but* MIGHTY

IRONICALLY, THE RECENT TREND IN RC has car manufacturers building bigger, more powerful vehicles, but Team Losi knew that it was onto something "big" by going small with its new, Mini-T. Like Losi's $\frac{1}{10}$ -scale Triple-XT, the Mini-T has 4-wheel independent suspension to smooth out the bumps, a 3-gear transmission and soft-compound racing tires with foam inserts. And since it's a ready-to-run, you get a sweet-looking, factory-painted and decaled body, and the truck comes professionally built. All of this for an inexpensive price tag of around \$150!

KIT FEATURES

CHASSIS. Just like the 1/10-scale Triple-Xt, the Mini-T has a molded, semi-tub chassis. The electronics sit in the middle of the chassis, and a 4-cell alkaline battery holder sits just underneath the combo ESC/receiver unit. This unit is attached to a pivoting plate with servo tape, and that allows easy access to the 4 AA alkaline cells that are required to power the truck (optional rechargeable packs can be bought separately). The front shock tower is secured to the front bulkhead with four screws while the rear tower is secured to the chassis with three screws. An additional screw runs through the transmission case and the rear tower to further stiffen the rear end. A welcome feature is that the front and rear sections of the chassis can be removed as separate assemblies, (the suspension, transmission and steering parts stay intact). This makes this truck a breeze to work on—just like its 1/10-scale counterpart.

DRIVE TRAIN. A 3-gear transmission sits at the rear. It and the plastic 5-gear differential are housed in a dust-proof case that's secured to the rear of the chassis. The transmission gears glide on metal-shielded ball bearings, while the rear axles and the front wheels spin on precision-cut plastic bushings. A stamped-steel motor plate is secured to the tranny case, and attached to that is a 280 motor (which can be easily adjusted when you want to swap pinion gears). The truck's spur gear is attached to the transmission's top shaft and features a unique slipper clutch that incorporates a wave washer for adjusting clutch tension. Shiny steel out-drives drive the rear stainless-steel dog-bones and rear axles.



The Mini-T's axles are bushed, but the 3-gear transmission gets a full set of ball bearings. With the exception of the gear differential, the little gearbox could be straight out of a Triple-Xt.

SUSPENSION AND STEERING. All four corners of this micro-truck are independently suspended. The four lower A-arms pivot on inner hinge pins that are secured with inboard plastic pivot blocks. The damping comes from plastic, coil-over, friction-type shocks. The front shocks can be adjusted to one of six positions in the shock towers and A-arms (three and two), and the rear shocks can be tuned with nine mounting possibilities.

Toe and camber can be adjusted using the front suspension's threaded links. The Mini-T's proportional steering comes from dual bellcranks that are connected with a plastic drag link. The bellcranks sit at exactly the same angle as the front kingpins to give the Mini-T crisp steering—a Team Losi design that it has used in its 1/10 racing cars since the introduction of the Triple-X. A spring-loaded servo-saver is attached to the front servo to protect it in the event of a crash. Out back, rear camber can be adjusted by changing the length of the threaded upper link, but toe-in is fixed at 2 degrees.



Here's the Mini-T with a Triple-Xt. It's big enough for the dirt but can still play indoors.

BODY, WHEELS AND TIRES. The Mini-T's pre-cut body shell has a two-color paint job, and the flame decals are applied at the factory.

The truck's one-piece, yellow dish wheels look identical to the ones on 1/10-scale Team Losi trucks. All four tires are supported by foam inserts that help to absorb the bumps. The front tires are actually patterned after Team Losi's popular Directional Ribs while the rear tires are smaller copies of Losi's proven Taper Pins.



INCLUDED ELECTRONICS & ACCESSORIES

TEAM LOSI 2-CHANNEL TRANSMITTER

This simple 27MHz AM 2-channel transmitter has servo-reversing for steering and throttle. The radio is comfortable to hold and includes a grippy steering wheel that resembles a full-scale 3-spoke rim and radial tire. There are two horizontally mounted knobs for adjusting throttle and steering trims. A third vertically mounted knob on top of the radio adjusts dual rate, which controls how much the wheels turn in both directions. Two LED lights serve as battery-level indicators.

POWERFUL RS-280 MOTOR

The rear-mounted, 35-turn, 280-size motor scoots the Mini-T along to just over 10mph. The motor's positive and negative leads are easily unplugged, so it's easy to remove and replace the motor.

MICRO STEERING SERVO

The Mini-T's microservo does a good job of cranking the front wheels in both directions. A spring-loaded servo-saver protects the unit in a collision. The trim comes set spot-on from the factory.

MINI-T DIGITAL ESC AND RECEIVER UNIT

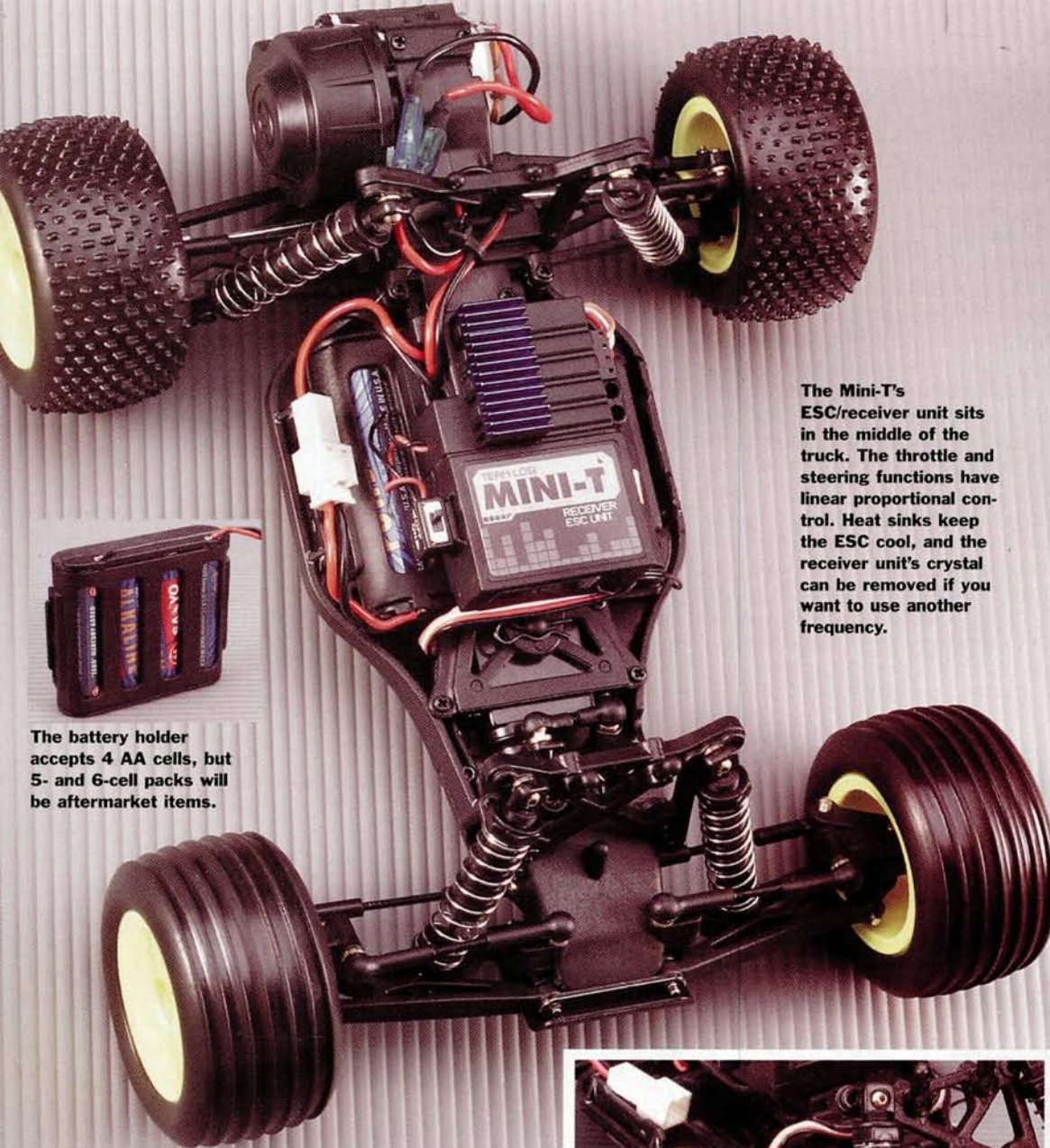
An integrated receiver/ESC unit sits in the middle of the Mini-T's small chassis. The digital ESC provides linear throttle response, braking and reverse. During normal operation, an anodized heat sink helps to keep the unit cool. The receiver contains a 27MHz frequency crystal, which can be swapped for optional crystals to accommodate other users on the same frequency.

you'll need

- 12 AA cells, and that's it!

factory options

- Ball-bearing set (8)—item no. LOSB1100; \$15
- Chrome wheels (F/R, 2)—LOS B1150/LOS B1161; \$4 each
- Directional Rib front tires w/foam inserts (2)—LOS B1153; \$9/pair
- Taper Pin rear tires w/foam inserts (2)—LOS B1163; \$10/pair
- Chrome rims w/tires glued on (F/R)—LOS B1175/LOS B1178; \$15/pair



The battery holder accepts 4 AA cells, but 5- and 6-cell packs will be aftermarket items.

The Mini-T's ESC/receiver unit sits in the middle of the truck. The throttle and steering functions have linear proportional control. Heat sinks keep the ESC cool, and the receiver unit's crystal can be removed if you want to use another frequency.

SPECIFICATIONS

MANUFACTURER Team Losi
MODEL Mini-T
DISTRIBUTED BY Horizon Hobby

SCALE 1/18
PRICE \$150
Price varies with dealer

DIMENSIONS
Wheelbase 5.6 in. (142mm)
Width 7 in. (178mm)

WEIGHT
Total, as tested 18.5 oz. (518g)

CHASSIS
Type Molded semi-tub
Material Plastic

DRIVE TRAIN
Type 3-gear transmission
Primary 14-tooth pinion/60-tooth spur (4.29:1)
Transmission ratio 2.71:1
Final drive ratio 11.63:1
Drive shafts Steel dogbones
Differential Bevel-gear
Bearing type Plastic bushings (wheels and rear hubs); metal-shielded bearings in the transmission

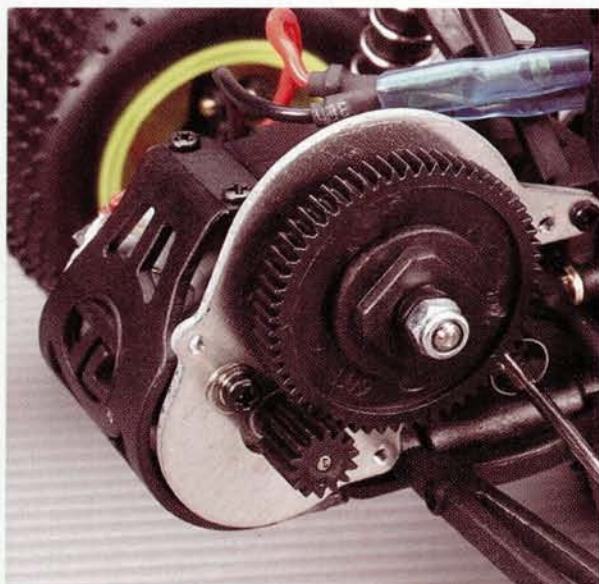
SUSPENSION (F/R)
Type Lower A-arms with upper links
Shocks Plastic-body, coil-over friction shocks

ELECTRONICS
Transmitter/receiver Team Losi 27MHz
ESC Team Losi w/integrated receiver
Servo Team Losi micro
Battery/charger Not included

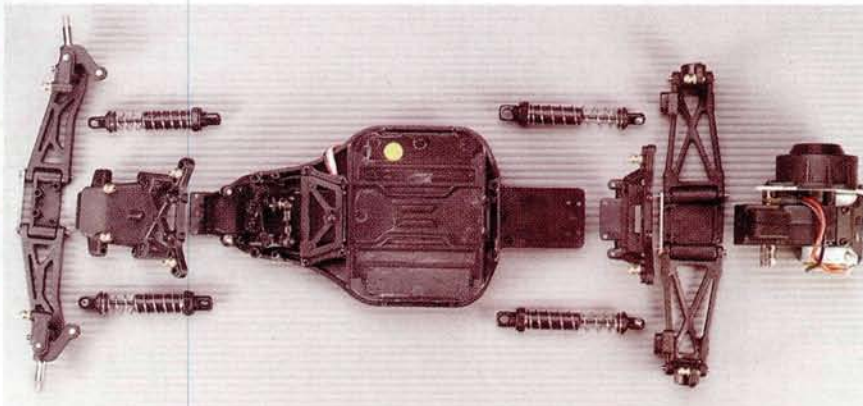
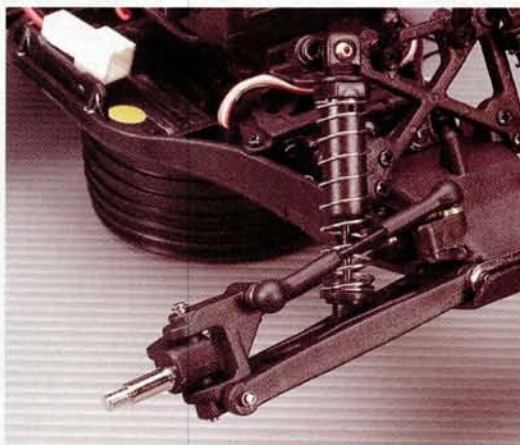
WHEELS
Type One-piece yellow dish

TIRES
(F/R) Soft-compound Directional Ribs/soft-compound Taper Pins

Left: the front shocks can be mounted in one of three positions in the shock tower and two in the lower A-arms. Camber and toe can be adjusted with the front end's threaded links. **Below:** the Mini-T's modular construction makes it easy to wrench on (if you get the urge). You could probably run it all year and never work on it.



Above: the Mini-T uses a pretty effective adjustable slipper clutch. Loosening or tightening a nut that presses against a wave washer adjusts the clutch tension. **Right:** the Mini-T's modular construction makes it easy to wrench on (if you get the urge). You could probably run it all year and never work on it.



PERFORMANCE

It took me less than three minutes to rip open a new pack of 12, AA batteries, install them in the truck and radio and put the body on; I know this because I timed myself to see just how long it would take to get the Mini-T up and running once it was out of the box. I first ran it in my house and found that it has gobs of traction on carpet—so much that it traction-rolled a few times. The steering was surprisingly crisp and very predictable. There was the usual on-power push but off power, the Mini-T turned on a dime. After running it under the coffee table and over the sandals my wife had told me to put away, I headed outside; the Mini-T was a little too fast for our small living room.

In the side yard, the Mini-T ripped up the loose dirt, and its 280 motor was able to throw up roosts that were so cool to watch that I did it again and again. It was time to break out the included cardboard jump, which I secured to my driveway using a small piece of duct tape. The Mini-T was just itching to take to the air. It jumped just like the 1/10-scale Triple-X^T. In the air, the truck was level and easy to control, but landings off jumps were a slightly different story: the truck bottomed out over the cardboard jump because of the undamped rear shocks. This scratched up the chassis' bottom, but the damage was purely cosmetic. Steering the Mini-T on cement was similar to steering it on carpet—precise and manageable. The truck's brakes worked really

well, too—plenty of consistent straight-line braking. The small rear Taper Pin tires actually barked like full-size tires.

I headed to the street to test top speed and radio range. The Mini-T quickly reached its top speed of 10.1mph, which is slow for a “big” car but speedy for a 1/18-scale machine (and there's much more speed on tap with optional 5 and 6-cell packs). I was able to drive it about two houses away from mine—about 200 feet. That's excellent range for a micro-truck with AM radio equipment. After running for nearly 40 minutes, I noted that the alkaline batteries showed signs of fading, so I decided to end the test session and to check for wear and damage. The bottom of the chassis was deeply scratched, and the rear tires' pins had worn down a bit, but everything else looked fine.

THE VERDICT

Team Losi's Mini-T surpassed many of my expectations. It's faster than I expected, more durable than I thought it would be, and I can't believe how well it steers and handles.

The Mini-T is an excellent buy, not only because of its price, but also because it can be run indoors and out and has a long run time. Cheap to own, cheap to run and goes anywhere; that's the ultimate combination for RC fun.



RATING THE TEAM LOSI MINI-T

	POOR	FAIR	GOOD	VERY GOOD	EXCELLENT
INSTRUCTIONS	The operating manual and the exploded view of the truck will make troubleshooting and repairs a breeze.				
INCLUDED ELECTRONICS	The electronics stayed cool throughout the test, and radio range was excellent.				
PARTS FIT AND FINISH	Everything appears to be expertly built—no binding anywhere.				
ACCELERATION	The Mini-T will surprise most people because it's fast and gets up to speed quickly.				
CORNERING ABILITY	The provided servo does an excellent job of turning the Mini-T.				
BUMP & JUMP HANDLING	The tires and friction shocks soak up the bumps really well, but landings are a little bouncy.				
DURABILITY	The Mini-T held up to some pretty gnarly tumbles, and only the bottom of the chassis was scratched during jump landings.				
RADAR TESTED TOP SPEED	10.1MPH*				
BEST BUYER	All RC fans.				

*With 4 AA batteries.

LIKES

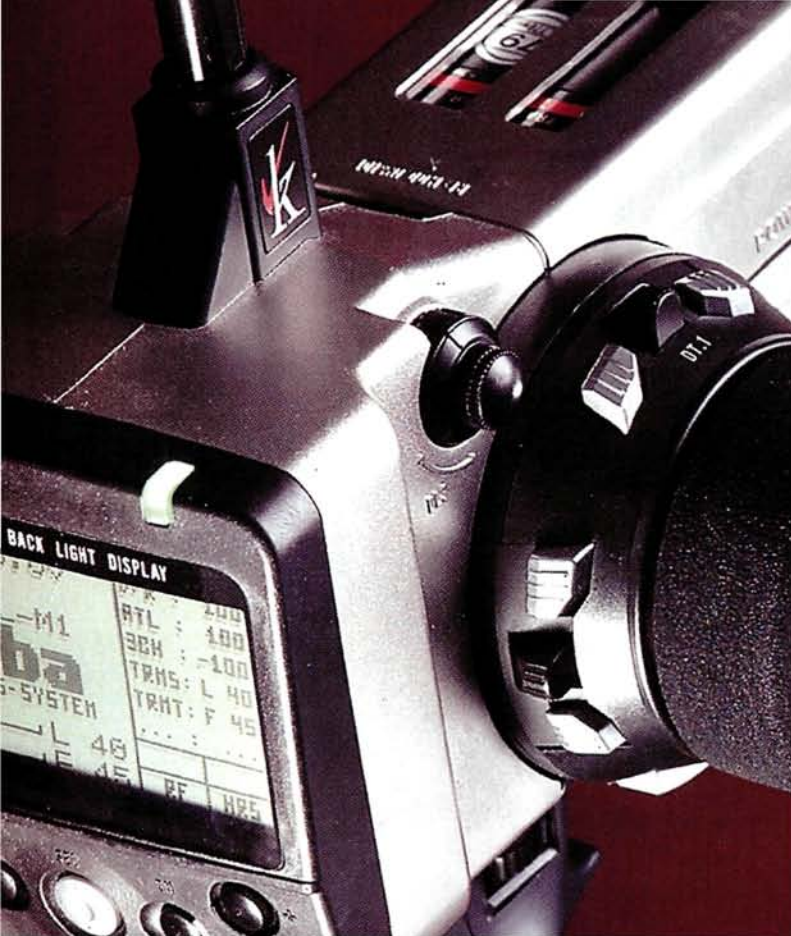
- > Exceptional 1/10-scale-type handling.
- > Quick and responsive.
- > Racy look and feel.
- > Absolute blast to drive.
- > Inexpensive.

DISLIKES

- > Suspension is a little too bouncy off the jumps.

SOURCES

Team Losi distributed by Horizon Hobby Inc. (800) 338-4639; teamlosi.com; horizonhobby.com.



HOT P





Photos by Pete Hall

STOLS!

PRO RADIO SHOOTOUT

WE SPEND A LOT OF TIME GETTING OUR CARS AND TRUCKS DIALED in to the track by tweaking the tires, shocks, electronics, motors and more, but do you ever think about which piece of equipment really touches you most directly? It's the transmitter. When you're out on the track, your entire RC experience is channeled through that pistol and the signals it shoots to your machine. When you're ready to race with the best (whether it's at the local track or at the national level), a reliable, fully adjustable, glitch-resistant system is a must-have, and we've got the best right here from Airtronics, Futaba, Hitec, JR Racing and KO Propo (in alphabetical order, no less). We'll explain the features, rate the radios and help you figure out which pistol you should be packin'. by the RC Car Action Team



AIRTRONICS

M8

THE M8 IS USED BY MORE PRO'S (including new IFMAR Off Road Champs Billy Easton and Ryan Cavalieri) than any other system and has captured more national and world championship titles than any other model. The M8 is also a favorite with everyday racers, as evidenced by its win of the RC Car Action "Readers' Choice" award six years in a row! The M8 has all the features racers demand, and its big, easy-to-navigate LCD makes programming a snap. The M8 has been around for several years, but it shows no signs of aging and has recently been updated with a backlit LCD screen. The M8 is also available with a Novak Switch synthesized transmitter module and an XXtra synthesized FM receiver for crystal-less operation.

QUICK SPECS

PRICE: \$289 (transmitter and receiver only; price varies with dealer)

AVAILABLE WITH: Novak Switch synthesized transmitter module and an XXtra synthesized FM receiver/various standard and premium servo options/rechargeable Ni-Cd battery pack and charger.

FM/PCM: FM

REMOVABLE MODULE: Yes

FREQUENCY SYNTHESIZER: Optional

CHANNELS: 3



LARGEST SCREEN

EASIEST NAVIGATION

SYNTHESIZED FREQUENCIES

RATINGS

INSTRUCTIONS

The instructions are short and sweet, but everything you need to know is there.

ERGONOMICS

The M8 feels balanced and has a comfortable grip.

NAVIGATION

By far the easiest radio to navigate and program. All the adjustments are displayed at once.



Here's what makes the M8 so great: its "everything visible" navigation system. Just put the cursor behind the function you want to adjust, then use the "increase" and "decrease" keys to tweak it.



FUTABA 3PK

"3P-SOMETHING" HAS ALWAYS BEEN a sign of supremacy in the Futaba line of high-performance radios. The 3PG swivel-head transmitter, better known as the Magnum Sr. back in the day, established Futaba as a technology leader in the modern era of radio control, and the company has never looked back. The new 3PK fills in where the earlier 3PJ left off—the premier competition radio of the Futaba line, always pushing the envelope of radio technology.

The 3PK is at the forefront of the latest transmitter technology with its High Response System (HRS) that can translate signals into servo movement almost as fast as you can think about it. The new 3PK ushers in easy-to-navigate, intuitive programming menus along with many other features that will keep this flagship machine at the top of the radio game for some time to come.

QUICK SPECS

PRICE: \$310 (transmitter and receiver only; price varies with dealer)

AVAILABLE WITH: transmitter and receiver only

FM/PCM: FM, PCM, HRS

REMOVABLE MODULE: Yes

FREQUENCY SYNTHESIZER: No

CHANNELS: 3



MOST ADJUSTABLE
HIGH-SPEED FRAME RATE

RATINGS

INSTRUCTIONS

Manual is very clear with step-by-step programming instructions. Some language may not be readily understood by novices, but the instructions are otherwise excellent.

ERGONOMICS

The grip is very comfortable, and the wheel and trigger movements are very smooth.

NAVIGATION

Excellent navigation; it rivals the best of the group. If you've waded through a high-end transmitter before, you won't need the book for this one.

The 3PK's module hides under a slide-off cover (not shown). Note that each trim has three buttons; the black center knob can be toggled left or right for fine adjustment, or you can hold down the silver button on either side for bigger moves.



HITEC CRX

The CRX is the flagship of the new Aggressor line, and it's a huge improvement over its predecessor, the Lynx 3D. The CRX offers plenty of high-end features such as subtrim, model naming, ABS and more. The standard version includes a DCX receiver and an HS-325HB servo with the transmitter, and it's the only transmitter in this showdown with a 20-model memory. The CRX is also available with Hitec's Spectra module that synthesizes any approved 75MHz channel—that's 30 channels. Another version is available with the Spectra module and Novak's XXtra receiver for complete synthesized and crystal-less channel selection. All versions include a rechargeable battery pack and charger.

QUICK SPECS

PRICE: \$200 (transmitter, receiver and HS-325HB servo; price varies with dealer)

AVAILABLE WITH: DCX receiver and HS-325HB servo/
DCX receiver and Spectra module/Spectra module and
Novak XXtra receiver

FM/PCM: FM

REMOVABLE MODULE: Yes

FREQUENCY SYNTHESIZER: Yes, with optional module and receiver

CHANNELS: 3



LOWEST PRICE

SYNTHESIZED FREQUENCIES



RATINGS

INSTRUCTIONS

All the information is there, but it's a little difficult to get through.

ERGONOMICS

Comfortable feel and better balance than previous models.

NAVIGATION

Easy to use, but two separate menus must be accessed.



The CRX displays exponential settings as a curve as well as numerically, making it much easier to anticipate how the settings will affect your car. Note the bars that bracket the screen; they indicate the trim settings and are always visible.

JR RACING R-1 PRO

JR RACING HELPED SET the standard for today's pro-level radios with one of the first dot-matrix displays. The JR R-1 Pro is the latest high-end radio from JR, and it's fully packed with features that allow the user to adjust and control almost every aspect on the car. In addition to stylish gold accents, the Pro model has Fast Frame Rate Modulation for quicker signal-to-servo response time. Additional features include 3 channels, 10-model memory, PPM/PCM modes and a fail-safe system. The easy-to-use keypad and large LCD screen make it easy to see what is being adjusted, and they help the user navigate through all the features. Depending on your skill level, the R-1 Pro can be switched between expert and beginner mode. The expert mode allows full access to all features, while the beginner mode locks out high-end functions to simplify operation.

QUICK SPECS

PRICE: \$350 (transmitter and receiver only; price varies with dealer)

AVAILABLE WITH: transmitter and receiver only

FM/PCM: FM, PCM, Fast Frame Rate

REMOVABLE MODULE: Yes

FREQUENCY SYNTHESIZER: No

CHANNELS: 3

HIGH-SPEED FRAME RATE

RATINGS

INSTRUCTIONS

The manual is clearly written and is laid out so that it's easy to find the feature in question for quick reference.

ERGONOMICS

The R-1 Pro is comfortable to hold, but it's the heaviest of the bunch and isn't evenly balanced.

NAVIGATION

The menus are easy to understand, but some are difficult to access without consulting the manual.

Hey, there's a fancy chocolate under my radio! Actually, it's the R-1's extra-large lap timer/stopwatch key. Next to a personal transponder system, the R-1's lap-counting system is the best practice tool.



KO PROPO EX-10 HELIOS

KO PROPO HAS BUILT a solid reputation over the years by producing innovative, rock-solid radio systems. With input from multiple world championship winner Masami Hirose as well as an impressive roster of team drivers that include Atsushi Hara, Josh Cyrul, Mike Swauger, Chris Dosek and Mike Blackstock, KO Propo has produced its best ever model with the EX-10 Helios. The Helios (named after the Greek god of the sun, for all you trivia geeks) is easy to use and feature-filled, and KO claims its Advanced HSR (High Speed Response) system translates signals into servo movement 30 percent faster than its predecessor's. A unique jog dial allows you to scroll through the radio menus with ease. KO offers optional equipment such as a PC interface that allows an infinite number of car-model memory settings and a wheel-extension unit, so you can drop the wheel and rotate it forward to suit your preferred ergonomic styling.

QUICK SPECS

PRICE: \$350 (transmitter and receiver only; price varies with dealer)

AVAILABLE WITH: transmitter and receiver only

FM/PCM: FM

REMOVABLE MODULE: Yes

FREQUENCY SYNTHESIZER: No

CHANNELS: 3



HIGH-SPEED FRAME RATE

RATINGS

INSTRUCTIONS

The instruction manual is thorough with good use of LCD screen shots throughout, and a liberal sprinkling of advice throughout the manual helps.

ERGONOMICS

Previous KO radios seemed to be designed for racers with small hands. The Helios is completely the opposite; it fits small hands and man-size mitts equally well.

NAVIGATION

The jog dial makes scrolling through the various menus easy. There are tons of menus and options to scroll through, so it will take time to learn all of the options available.



Rotating the Helios' jog dial scrolls you through the various tuning options and makes it easy to see where you "were" as well as where you're "going." The large display is also backlit, so when the Mains run into the evening, you'll still be able to read the screen without needing night-vision goggles.

EDITORS' COMMENTS



Airtronics M8



Futaba 3PK



Hitec CRX



JR Racing R-1 Pro



KO Propo EX-10 Helios

STEVE POND The M8 is dominant in most major forms of racing in the U.S. and has won the radio category of our "Readers' Choice" awards for many years. The M8 is comfortable, and the ease of navigation is tops. I would like to see a model with high-response and PCM capability, but the M8 is still a top choice.

The 3PK sets new standards with its vast array of features, yet navigating through them is much easier. The 3PK can be used with the right or left hand and includes an adapter to drop the steering wheel. I find the entire package the most appealing of the group; this my favorite radio.

The CRX is light and has a low center of gravity; this is a benefit to nitro racers who often have to hold the transmitter for up to an hour. The CRX ranks high on the value scale; it comes with a servo and is about the same price as the least expensive version of any other radio that comes with only a receiver.

The R-1 is one of the best radios in the "top-gun" category, and it's among the most well-equipped radios of the group. It's also the heaviest, and that exacts a toll for long-haul racing, but it's worth a little more bicep pump to have the power of the R-1 at your fingertips.

KO Propo is well-known for its premium-quality electronics, and the Helios' new menu system is much easier to navigate than that of the previous EX-1 Mers; the Helios has a dial and a few buttons that provide more intuitive surfing. The comfortable grip, performance and reliability of the Helios make it one of my top three.

MATT HIGGINS The display is what I like best about the M8. There are no multiple menus to scroll through, and you don't have to remember where certain features that you might want to adjust might be hidden. On the M8, all the adjustments are on one screen. If it was available with a synthesized channel system, it just might have been my top choice.

Quite frankly, the 3PK has more adjustments than I'll probably ever use! As for using the 3PK: after you've figured out what the buttons under the screen do, it's easy to navigate through the menus and sub-menus. Also, left-handed racers will definitely appreciate how easy it is to convert the 3PK for southpaw use.

The CRX gets points for its synthesized channel selection with two versions that include the Spectra module. The only thing I might fault the CRX for is that some of the cool features of the Lynx 3D weren't carried over, but because it has all of the must-have racing features, synthesized frequency packages and a low price, the CRX is my top pick.

I like the R-1's display-only feature, and the programmable thumb switch makes the lap-counting feature very easy to use. I did find the R-1 Pro a little on the heavy side and a little bit off-balance; this isn't a big deal, but it might make the radio awkward to hold for long Mains.

It was simple to navigate through the Helios' many features, and I really like the auto-display feature that instantly brings up the proper screen for whatever I might be adjusting. The jog dial is very easy to use; it was a welcome break from having to hit button after button.

GEORGE GONZALEZ The M8 stands out as my favorite. It has the largest LCD screen, all of the functions are displayed simultaneously, and it has a balanced feel. The addition of a new backlit LCD allows you to read the screen more clearly under direct sunlight and in complete darkness, and the crystal-less operation option is a biggie for any racer.

I like the 3PK's rear-mounted LCD screen, comfortable grip and easy-to-access trim levers. I also like the three-tiered menu that separates the most commonly used functions from the advanced features; it makes setting up a model a piece of cake. The 3PK looks a little intimidating but it's actually very easy to program.

Learning how to use the CRX is easy, thanks to the straightforward programming and easy-to-follow instructions. After you've used the CRX once or twice, you'll never have to refer back to the instructions to remind yourself how to make an adjustment. It's also the most affordable of the bunch.

The large, bottom-mounted LCD screen and gold trim levers and steering wheel make this radio a standout. The R-1 Pro's classy look is a perfect complement for the transmitter's full array of racing features. The R-1 Pro has a comfortable grip and good overall balanced feel, and all the trim levers and buttons are easy to access while driving.

The Helios has an exceptionally well-balanced feel, and the jog dial makes scrolling through to functions fast and easy. I like the PC interface feature that allows you to plug your transmitter into your computer to upload and save setups. I also like that handgrips are available in different sizes and colors to customize the feel and look of the radio.

JOHN HOWELL The M8 unit has been king for a long time, and rightly so; it's arguably the easiest to use, has a proven track record for reliability, and you just can't beat the fact that everything you need to see is right there on the LCD screen. Sure, it's the oldest radio of the bunch, but you still have to give the M8 its props! It's a damn fine piece of equipment.

Navigating through previous Futaba computer radio systems was difficult, but the 3PK is quite easy to use (second only to the M8). It's also feature-filled and is a really comfortable radio. The 3PK can be fully customized to fit a variety of racers. Overall, I'd rank the this radio right up there with the best of the bunch.

The Hitec CRX is the most inexpensive radio of the group and has a ton of features for the money, but I didn't find it as user-friendly or as intuitive as other radios featured in this guide. I think it's a much better radio than its predecessor, the Lynx 3D, and you definitely can't ignore its budget-conscious price.

Like the M8, the R-1 has been on the scene for a while, and for good reason: it has a ton of features, and that makes it a desirable radio, even by today's standards. In my opinion though, the R-1 has a few knocks against it. It's a little heavy for my taste, and I don't particularly care for the radio's ergonomics. I find it a little cramped).

The EX-10 Helios is very easy to use and navigate, and it's very comfortable. Like all the radios in this guide, the Helios is also very feature filled, and I really like its new jog dial (it helps bring out the inner DJ in me). If I had to choose one radio out of this bunch to spend some time with, I'd grab the Helios.

PAUL ONORATO The Airtronics M8 has been one of the most popular radio systems for several years, and this can be largely attributed to its easy navigation. The M8 is one of the few radios that you can figure out how to use without the help of the manual. When that's combined with a backlit display screen, it makes a hard-to-beat package.

The 3PK's design is a departure from the norm. You can easily see the rear-facing, dot-matrix, backlit screen when driving. Access to the countless features is a cinch, and they can be quickly learned without constant reference to the manual. Only the M8's ease of use is better.

One of the CRX's biggest draws is its great value and the option of crystal-free operation. I also like the CRX's compact size; it's hard to believe how many features are packed into it. What left me scratching my head was the loss of some useful features that its predecessors had, such as the display-only and idle-up functions.

Eye-catching good looks with gold accents and clean styling make the R-1 Pro a clear standout. On the downside, the R-1 Pro is the heaviest of the group and isn't as well balanced as the other radios, but its styling, tons of features and big LCD screen make this radio my number-one pick.

I think the Helios' style is too busy, but KO has a reputation for producing high-quality radio systems, so I put my looks gripe aside. I found that accessing the features is far easier than with previous models, and the jog wheel is a clever and efficient way to access the menu. The grip is comfortable, and the wheel position is adjustable.

FEATURE COMPARISONS

	AIRTRONICS M8	FUTABA 3PK	HITEC CRX	JR RACING R-1 PRO	KO PROPO EX-10 HELIOS
FM/PCM	FM	FM, PCM	FM	FM, PCM	FM
Channels	3	3	3	3	3
Weight with batteries	30.3 oz. (855g)	28.8 oz. (816g)	23.2 oz. (658g)	31.5 oz (894g)	28 oz. (786g)
Receiver dimensions	42x27x15mm	26x38x14mm	40x20x37mm	36x27x14mm	29x24x16mm
Rechargeable pack	Optional	Y	Y	Optional	Optional
Charger	Optional	Y	Y	Optional	Optional
High-speed frame rate	N	Y	N	Y	Y
Model memory	10	10	20	10	9
Battery voltage monitor	Graphic & numeric	Numeric	Graphic & numeric	Numeric	Numeric
Operation timer	Y	Y	Y	Y	Y
Count-up timer	Y	Y	Y	Y	Y
Countdown timer	N	Y	Y	Y	Y
Lap timer	Y	Y	N	Y	Y
Adj. trim rate	Y	Y	Y	Y	Y
Subtrim	ST, TH	ST, TH, CH3	ST, TH, CH3	ST, TH, CH3	ST, TH
Dual rate	ST	ST	ST	ST	ST, TH
Endpoints	ST, TH	ST, TH, CH3	ST, TH, CH3	ST, TH, CH3	ST, TH
Exponential	ST, TH	ST, TH	ST, TH	ST, TH	ST, TH
Servo speed	Y	ST, TH	N	ST, TH	ST, TH
Auto start	N	Y	N	N	Y
ABS	Y	Y	Y	Y	Y
ABS cycle	Y	Y	Y	Y	Y
ABS delay	Y	Y	Y	Y	Y
ABS depth	Y	Y	Y	Y	Y
Idle up	Y	Y	N	Y	N
Tone on/off	Y	Y	N	Y	N
Tone volume	Y	Y	N	Y	Y
LCD contrast	Y	Y	N	Y	Y
Backlight	Y	Y	N	N	Y
Auto display	Y	Y	N	Y	Y
Left-hand convertible	Y	Y	N	N	N
Display-only mode	Y	Y	N	Y	N
Fail-safe	N	Y	N	Y	N
Channel mixing	N	Y	Y	Y	N
Direct servo control	Y	Y	N	Y	Y
Drop-down wheel	Optional	N	N	N	Optional

KEY FOR CHART: ST = steering • TH = throttle • CH3 = third channel • FM = frequency modulation • PCM = pulse code modulation

GLOSSARY

ADJUSTABLE TRIM RATE. If you've ever wished you could set how much servo movement you get with each "click" of trim, this is the function you want. By adjusting the trim rate, you can set the percentage of travel each "click" of trim represents.

ANTI-LOCK BRAKES (ABS). The ABS function is invaluable when racing on slippery surfaces and when running cars with rear-wheel braking only. When ABS is set, applying the brakes will cause the servo to pulse or to quickly engage and disengage the brakes for smoother, more controlled braking. Most ABS systems allow you to set the "delay" (the time it takes for the ABS to engage), the "depth" (the total travel of the servo during pulsing) and the "speed" (the rate at which the servo pulses back and forth).

AUTO DISPLAY. Radios with this feature automatically display the setting for the trim lever you're using, so you don't have to scroll through menus.

AUTO START. The exact operation of this feature varies with brand, but in general, it lets you program a throttle position that the radio will automatically transmit as soon as the trigger is moved out of neutral. You might set it for ½ throttle as a traction-control device or for full throttle for a drag-style launch—or anywhere in between. Once the trigger has returned to neutral or the brake has been applied, the throttle function returns to fully proportional control.

DIRECT SERVO CONTROL. A patch cord that is attached to the transmitter and the receiver that allows you to adjust the servos or ESC (on an electric vehicle) without turning on the radio

and emitting a signal that can cause interference to others on the same channel.

DISPLAY-ONLY MODE. This allows you to turn on the LCD screen without sending a radio frequency (RF) signal. This is very useful for making radio adjustments in the pits when other racers share the same channel.

DUAL RATE. This allows you to alter the servo travel on both sides of neutral simultaneously, and it's most often used for the steering channel. Unlike endpoint adjustments, which are made independently for left and right throw, dual-rate adjustments affect servo throw in both directions.

ENDPOINT. Endpoint adjustments allow you to set left and right servo throw independently. Adjustable endpoints are particularly useful for adjusting a nitro car's throttle/brake servo because it may require significantly more travel to operate the throttle than the brake.

EXPONENTIAL. This allows you to adjust the servo's response around neutral. For example, if the expo is set for a negative value, the servo will respond less quickly to steering wheel or trigger movement near neutral. Conversely, it will respond more quickly as the limits of travel are reached. A positive expo setting does the opposite: it's faster near neutral and slower as the servo reaches its travel limit. The greater the expo value, the greater the difference in servo speed, from slowest to fastest.

FAIL-SAFE. This feature is only found on PCM radio systems. The fail-safe system returns the throttle servo or ESC and steering servo to neutral positions in the event of radio interfer-

ence or loss of power to the model. This invaluable feature prevents the vehicle from going out of control if you encounter a glitch.

FRAME RATE. Frame rate is the speed at which the transmitter "fires" bundles of information to the receiver. Some of the radio systems in this shootout allow a faster than usual frame rate to better exploit the superior processing speeds of digital servos.

FREQUENCY MODULATION (FM)/PULSE CODE MODULATION (PCM). FM and PCM provide cleaner, more reliable reception than amplitude modulation (AM) systems and are preferred by racers because they are less prone to glitching at the track. PCM systems have the extra advantage of fail-safe capability; you can set the receiver to move the servo(s) to default positions in the event of signal loss or interference.

IDLE UP. This is used exclusively for nitro-powered cars. When idle-up is selected, the throttle servo moves to a position you set to speed up the idle for easier starting or warmup. When idle-up is switched off, the throttle servo returns to the designated neutral position.

MIXING. This feature allows you to "mix" the transmitter's channels so that the throttle will also influence steering and vice versa. This function is rarely used with cars, but it is popular with boats; a little rudder is often mixed with the throttle to prevent the boat from pulling to one side when it accelerates.

MODEL MEMORY. Lets you store the data for multiple models and various setups for the same model in the transmitter's memory. Each mode and setup is assigned a model number. All the radios in this shootout have

model-"naming" capability, so you can call up a model by name.

OPERATION/COUNT-UP/COUNTDOWN/LAP TIMER. This tells you how long your radio has been switched on, and that helps you to monitor the battery condition. A count-up timer counts up from zero and is good for monitoring run time. A countdown timer counts down from your set time to zero, and it's good for timing a race. Such a timer is especially useful when you're stuck with a pesky announcer who never tells you how much time is left on the clock; the lap timer counts individual lap times (of course!).

SERVO SPEED. You can't increase a servo's speed with this function, but you can slow its transit time. If your new super-servo makes your car feel twitchy, or having a lightning-quick servo is a liability (e.g., in oval racing), try adjusting servo speed.

SUBTRIM. A very fine trim function. If one "click" of the trim is too much, the subtrim will allow you to make a more precise, smaller adjustment.

SOURCES

AIRTRONICS (714) 978-1895; airtronics.net.

FUTABA distributed exclusively by Great Planes Model Distributors (217) 398-6300; (800) 682-8948; futaba-rc.com.

HITEC RCD INC. (858) 748-6948; hitecrdc.com.

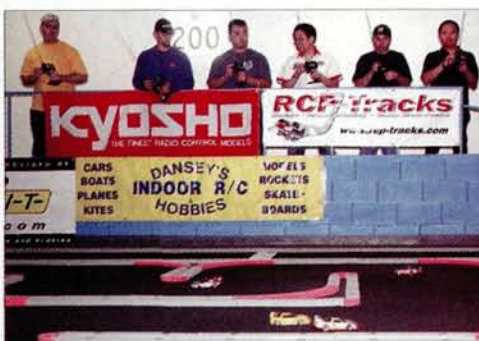
JR RACING distributed by Horizon Hobby (800) 338-4639; horizonhobby.com.

KO PROPO USA INC. (310) 532-9355; kopropo.co.uk.

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BY THE RC CAR ACTION TEAM



BOARD WALK

FROM THE
RADIOCONTROLZONE
COM BULLETIN BOARD

Racing barriers

XXXSTEVE: Any ideas about what I could use as inexpensive portable racing barriers?

KMAC: PVC drainpipe; it isn't as heavy as regular PVC, and it's cheap.

GGFX-MIKEY: You can use some old garden hoses; just tape them to the ground.

My engine stalls at 1/4 or more throttle.

GUVER: My engine stalls anytime I go over 1/4 throttle. It isn't quite broken in yet, and I don't know what to do.

RCRACER2471: Tune the carburetor's needles back to the factory settings. From what you described, it sounds as if the engine is too lean on the top end and is starved for fuel.

COOLHEAD: Replace the glow plug and tune in very small increments.

Bearing maintenance

ZIGGO: Which oil should I use to re-oil metal-shielded bearings after I have cleaned them?

TALLCRACKER: Use a lube made for bearings. It tends to be light enough to get past the seals but not so light that it leaks out. Use just one drop of oil; any more just collects dirt.

GUTTER BALL: Zubak's Speed Lube seems to be the fast guys' choice.

HIGHROLLER: Fill an empty paint jar with motor cleaner and dump your used bearings into it; shake the jar or let the bearings soak overnight. Fill a second jar with enough 3-in-1 oil to cover the bearings and let them soak in it.

BE HEARD! LOG ON AT
RADIOCONTROLZONE.COM

BIG FINALS for SMALL CARS

Las Vegas was the final stop for the Kyosho Mini-Z Cup race series. Drivers with the original MR-01 F1 chassis competed for national championship titles in Mini-Z Stock, Mini-Z Open and Mini-Z F1 Open. Bill Crotty Jr. from Lee, NH, took top honors in Mini-Z Stock; Philip Ng from Temple City, CA, won the Mini-Z Open, and Mike Wenzel of Sun Prairie, WI, took the victory in the F1 Open class. Stay tuned for more coverage of Mini-Z race action coming soon in RC Car Action.

SITE SEEING



Mini-Z World has tons of information for the Mini-Z racer. The site contains tips and tricks, a discussion forum, an awesome photo gallery of tricked out Mini-Zs and up-to-date news about fads and products for these palm-size cars.

Jimmy Babcock Racing League

Team Losi/Team Orion factory driver Jimmy Babcock has started his own electric RC racing league. Babcock has a reputation for putting together very successful races, including the annual Hot Rod Hobbies Off-Road Shootout (400+ entries) and the Reedy Truck Race of Champions. The six-race schedule visits the hottest tracks throughout the SoCal area. Many of the industry's top manufacturers have jumped on board as sponsors; racers will have a chance to win major prizes at each event and rub fenders with factory pro's. If you can't make it to all of the races, no worries; two of the six rounds will be throw-outs, and the four remaining finishes will be tallied. For more information, check out jimmybabcock.com.



"Check it out, I saw DJ Lethal do this once ..."

Mugen takes the Japan Nitro Nationals



Hokusei, Japan: 93 of the fastest nitro on-road racers in Japan battled for the Japanese National Champion crown. To compete, the racers had to be either factory sponsored or supported by a major RC manufacturer. Notable drivers

Atsushi Hara of HPI and 13-time world champ Masami Hirotsuka of Yokomo competed in the event. Kelsuke Fukuda TQ'd the race; he posted the only 16-lap run during qualifying. Hirotsuka set the fastest lap (19.68) during the main event with his prototype Yokomo tourer, but he had technical troubles that prevented him from finishing. He ended up a respectable eighth overall. Hara had engine troubles in the semifinals and had to settle for 15th place. Fukuda won the Invitational from the pole with his blistering-fast Mugen MTX-3.

"When Brian Kinwald talks setup, everyone shuts up and listens."

Team Orion/Peak's Rick Howard at the IFMAR Worlds.

SPEED SHOP



SIRIO S12TRPI .12 engine

New from Sirio is this updated .12 engine—the S12TRPI. It features updated porting, crank timing and piston design that result in higher rpm and more overall power. The engine includes both standard and turbo-head buttons. As far as engine specs go, it has three ports, ABC construction, a slide carburetor and an SG shaft. Sirio claims that the engine pumps out 1.43 hp at 41,000rpm.

S12TRPI .12 engine—\$321.

Sirio; distributed by Trinity (732) 635-1600; teamtrinity.com.

TAMIYA

Limited Edition TB Evolution III Blue Conversion Set

Want to make your Tamiya TB Evolution III stand out from the crowd? If you do, then you'll want this new, limited-edition Blue Conversion Set. You get a full set of assorted blue-anodized parts to replace all the stock aluminum parts (it even includes a yet to be released blue-anodized motor mount).

Inside the box you'll find the motor mount, steering arms (left and right), suspension mounts and a propeller shaft, a one-way battery holder, a spur-gear holder, two swingshafts and two steering posts.

Limited Edition TB Evolution Blue Conversion Set—49335; \$165.

Tamiya America Inc. (800) 826-4922; tamiyausa.com.



REEDY Dyno-tuned 19-turn Spec motor

This new tweaked 19-turn Spec motor is fresh off Reedy's in-house dyno. This version of the Spec motor still uses the same Krypton four-magnet can as the original 19-turn spec motor. It also uses laydown brush technology, comes with a standard comm, an orange molded endbell and a wild-looking flame sticker. The motor doesn't currently meet ROAR 19-turn motor rules (which might be changed), so Reedy also offers a hand-wound armature (the standard motor comes with a machine-wound armature) that makes the motor legal in ROAR-sanctioned events. The hand-wound armature (item no. 510) retails for \$35.

Dyno-tuned 19T Spec motor—\$14; \$60.

Reedy; a division of Team Associated (714) 850-9342; teamassociated.com.

INTEGY

SHE 14A auto-voltage power supply

Integy's newest 110V AC/220V AC to 12V DC power supply is a very versatile unit. The power supply comes with solid-state components and an ultra-reliable power source that features 14 amps of output power. In addition, it is very small (2x3.5x9 inches) and light (only 2.75 pounds). For input, the supply handles AC 100 to 120 volts and 200 to 240 volts, and the output is adjustable from 9.5 to 14.5 volts.

SHE 14A auto-voltage power supply—1647; \$138.

Integy (909) 444-2766; integy.com.



TRINITY

"No Brainer" body-post markers

You can now take all the guesswork out of marking body-mounting holes in your new painted body. Simply place these post caps on your body posts, position the body where you want it and push down. The No Brainer body-post markers will dimple the body where you should drill your holes. Now there are no more excuses for having a misaligned body. Trinity says, "It's a no-brainer!" The markers fit most popular body-post sizes.

Trinity No Brainer body post markers—TRI30003; \$10.

Trinity (732) 635-1600; teamtrinity.com.

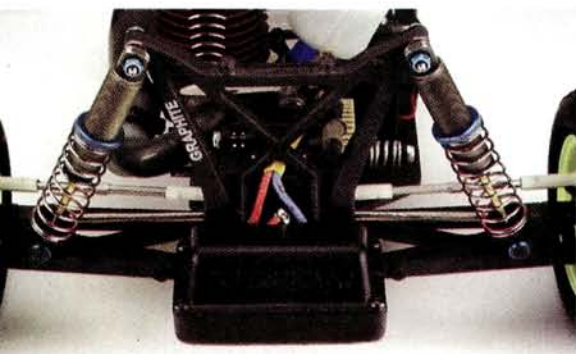
UNDER THE HOOD

Adam Drake's Team Losi Triple-XNT

EQUIPMENT USED

Transmitter: Airtronics M8	Glow plug: MC59
Steering servo: Airtronics 94357	Receiver: Novak XXL
Receiver pack: Trinity 1250 NiMH	Engine: Trinity/Novarossi .12
Tires (F/R): Losi Taper Pin (silver/red)	Throttle servo: Airtronics 94737
Body: Losi Fury NT	Inserts (F/R): Losi firm/Trinity 2-stage
Manifold: Losi/Drake	Pipe: Losi/Drake
Clutch: MIP	Fuel: Trinity Platinum 20%

SETUP	FRONT	REAR
Setup	Front	Rear
Caster/pivot support	Stock 30 deg.	2 deg.
Camber	1 deg. negative	0
Toe-in	1 deg. in	3 deg. inside/1 deg. outside
Ride height	Arms level	Arms level
Bump-steer washers	1 on spindle/0 on bellcrank	—
Ackerman	Outside hole on bellcrank	—
Spindle height	Bottom	—
Servo position	Front	—
Spindle/carrier mount	Hole B	Hole A
Inner camber rod	Hole 3	Hole 2
Outer camber rod	Hole B	Hole A
Camber link spacers	1	—
Shock fluid	Losi 30WT	Losi 40WT
Shock piston	56	56 (drilled)
Shock spring	Red	Orange
Shock limiters	0.120 in. (inside)/0 outside	Unthread the rod end 1.5 turn
Shock-tower mount	Hole 2	Hole 4
Arm mount	Middle	Inside
Rear hub spacing	—	Center
Drive shafts	—	Dogbone
Outdrives	—	Steel
Swaybar	No	No



The rear end of Adam's truck is pretty much stock except for the Trinity aluminum nuts and preload adjustment collars. Check out the big cave washers that secure the lower shock-rod ends to the suspension arms; those shocks will never pop off.

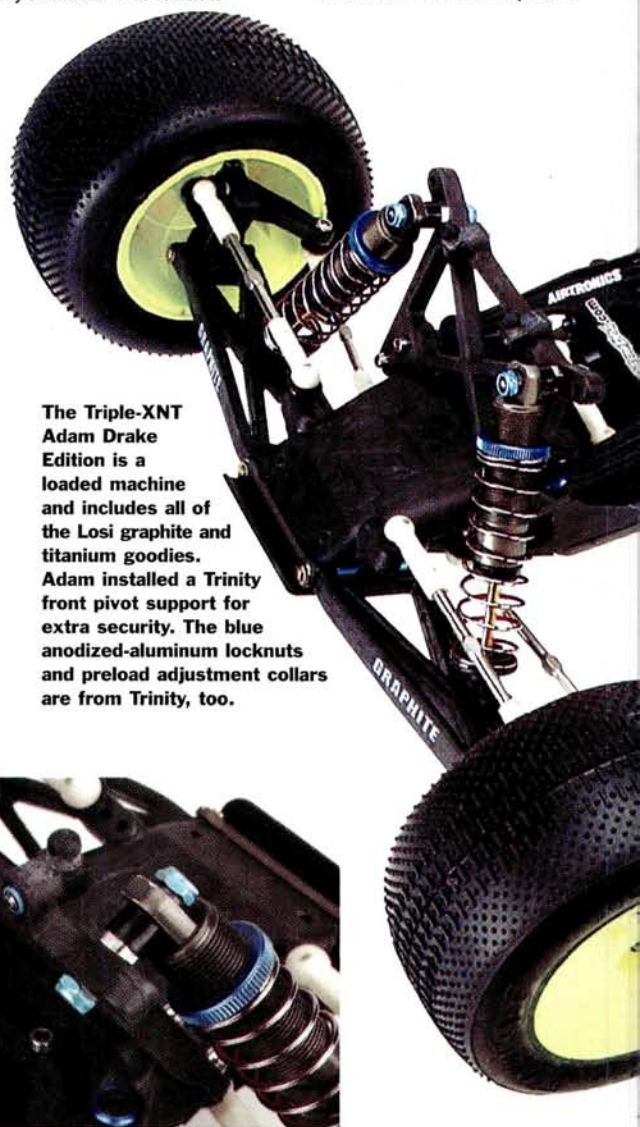


Adam's truck has no shortage of horsepower thanks to the specially massaged Adam Drake Edition Novarossi .12 engine. Adam prefers a rotary carb to a slide carb because it simplifies the throttle linkage routing, and it's easier to remove and reinstall. That's a Team Losi Kevlar 51-tooth spur gear; it's much stronger and smoother than the stock spur gear.

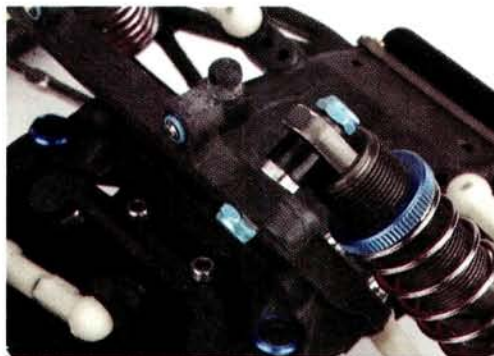


FACTORY OPTIONS

- Lunsford Quick-Tune shock mounts
- Lunsford titanium screws
- Trinity aluminum 1-deg. hub carriers
- Trinity aluminum 4-40 locknuts
- Trinity aluminum front pivot block
- Team Losi titanium-nitride hinge pins
- Team Losi Kevlar 51-tooth spur gear
- Team Losi aluminum top shaft



The Triple-XNT Adam Drake Edition is a loaded machine and includes all of the Losi graphite and titanium goodies. Adam installed a Trinity front pivot support for extra security. The blue anodized-aluminum locknuts and preload adjustment collars are from Trinity, too.



The shocks are mounted on the shock tower with Lunsford's quick-release shock mounts. They're "nutt'd" on both ends, so you can move the shocks to new pistons without totally dismantling the shock mount. Adam's truck is adorned with many blue-anodized nuts, screws and conical washers.

Adam prefers to use Trinity's aluminum rear hub carriers because they're stronger than the stock pieces, and for extra security, the hinge pins are secured with a setscrew in addition to the E-clips.



FACTORY DRIVER HOT MOD

Adam hard-wires his onboard receiver pack and uses 14-gauge wire instead of the thin-gauge stuff that's typically included with receiver packs. Adam removed some of the insulation on the positive and negative lead wires so that he can attach alligator clips for charging—no connectors to come apart during a race.



SOURCES

AIRTRONICS (714) 978-1895;
airtronics.net.

LUNSFORD RACING
(541) 928-0587;
lunsfordracing.com.

NOVAK ELECTRONICS INC.
(949) 833-8873;
teamnovak.com.

NOVAROSS distributed by Trinity
products Inc. (732) 635-1600;
teamtrinity.com.

TEAM LOSI; distributed by
Horizon Hobby Inc.
(800) 338-4639; teamlosi.com.

TRINITY (732) 635-1600;
teamtrinity.com.

5 QUESTIONS



DRIVER: Adam Drake

AGE: 24

LAST BIG WIN: 2003 Reedy Truck Race of
Champions Factory Gas Truck

SPONSORS: Team Losi, Trinity, Novarossi,
TempGun.com, Airtronics, Lunsford,
MIP, Novak, OFNA, Jammin Products, A Main
Bodies, SkipGear, Upgrade, The Dirt, OFNA,
thedrake.net.

WHEN I'M NOT RACING, I like to: wrench and
get ready for the next event.

RC CAR ACTION: Andre the Giant has a posse;
Adam the Drake has a Losi. Who came up with
that sticker?

ADAM DRAKE: Actually, my friend J. Fillipow
from Georgia made the stickers. He's the guy
you see at the races with the black, square
tattoo on his leg. One of J's friends started the
Andre the Giant stuff in 1989, and J made
the sticker as a joke, but it has turned into a
pretty big deal. Every race J attends, he puts the
stickers everywhere.

RCCA: I understand that you work full-time for
Team Losi. What's your official title?

AD: I have been racing for Team Losi since 1994
and have been working for them for the past
three years. I work in the research and develop-
ment department, and also help with the team
planning and preparation for off-road racing.

RCCA: What would you say are the three most
important hop-ups you can make to the
Triple-XNT Drake Edition?

AD: Team Losi titanium-nitride hinge pins, Trinity
aluminum front pivot block and Lunsford
Titanium shock mounts.

RCCA: What are the most important aspects of
becoming a faster RC driver?

AD: Practice and preparation. In gas racing, a lot
of the work needs to be done before the race.
Making sure that everything is prepared is key—
having the engine broken-in, the starter box
charged, the igniter charged, everything clean
and rebuilt.

RCCA: Do all of the Losi guys have Mini-Ts and
race them around during lunch? Any hop-ups in
the works?

AD: Some of us don't have Mini-Ts yet, but I'm sure
that's what we'll be doing when everyone gets
them. Some of the hop-ups we are working
on include fluid-filled shocks, ball differential, foam
tires, rubber tires, new body styles and much more.

PRO-Line



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endless summer CLASSIC



Final Score: Losi 6, Associated 1

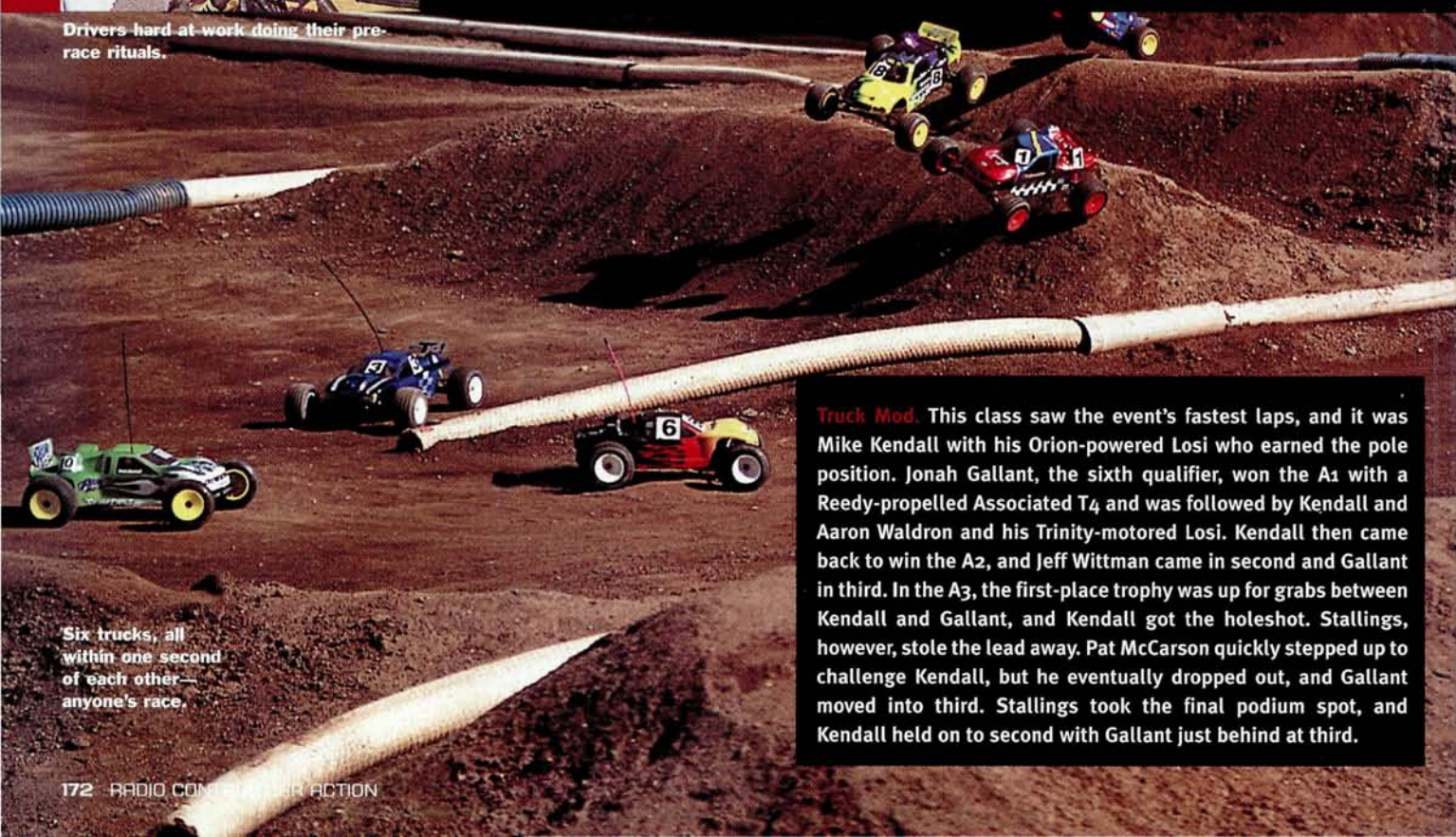
by Lito Reyes

Every year here in Southern California, we can count on a hot summer, the Santa Ana wind and the end-of-summer RC blast called the Endless Summer Classic. Pro-Line, Pegasus Hobbies and *Radio Control Car Action* say goodbye to the long days and good times of the summer season with the Classic, which gives SoCal off-road racers one last chance to be top dog.

The 2003 Classic was all about the Losi guys; they dominated the race with wins in six of the seven Stock, Modified and Sportsman classes. The event took place at Pegasus' track in Montclair, CA. Pegasus owner Tom Macomber designed a tough course that featured a very steep double jump off the back straight that ensured dramatic jumps, and veteran SoCal race director Charlie Barnes ran the event with the assistance of Angie Grodell.

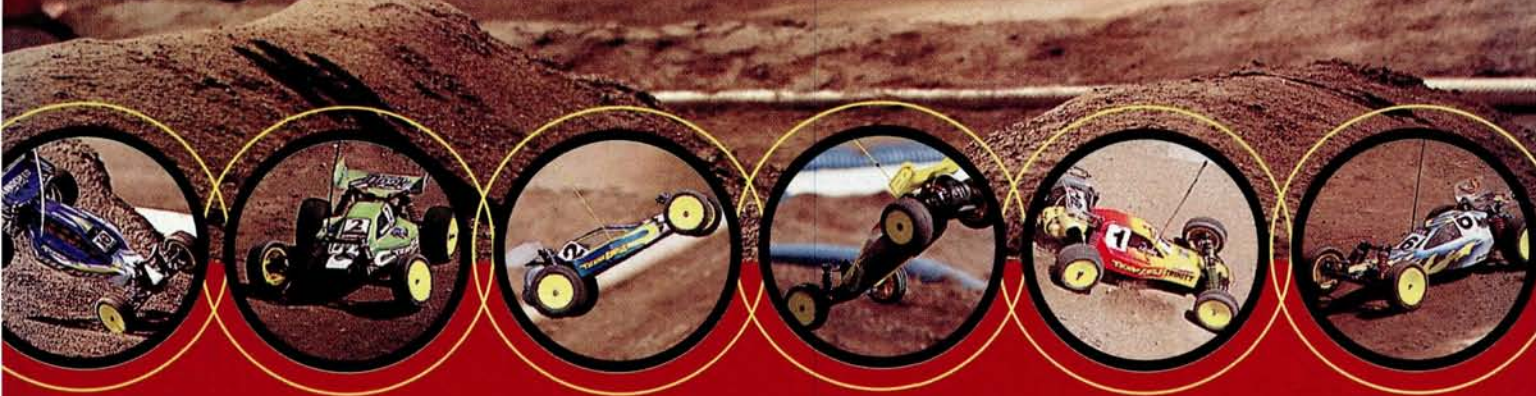


Drivers hard at work doing their pre-race rituals.



Six trucks, all within one second of each other—anyone's race.

Truck Mod. This class saw the event's fastest laps, and it was Mike Kendall with his Orion-powered Losi who earned the pole position. Jonah Gallant, the sixth qualifier, won the A1 with a Reedy-propelled Associated T4 and was followed by Kendall and Aaron Waldron and his Trinity-motored Losi. Kendall then came back to win the A2, and Jeff Wittman came in second and Gallant in third. In the A3, the first-place trophy was up for grabs between Kendall and Gallant, and Kendall got the holeshot. Stallings, however, stole the lead away. Pat McCarson quickly stepped up to challenge Kendall, but he eventually dropped out, and Gallant moved into third. Stallings took the final podium spot, and Kendall held on to second with Gallant just behind at third.



2WD Mod. In A1, Scott Hughes running a Reedy-powered Associated battled with Kyle Stallings, who also relied on a Reedy/Associated combo. It was Pro-Line's Hughes who came out on top. Stallings and the Banzai-powered Losi of Jared Volz were still very much in contention. Stallings fought back in A2 to beat Hughes and Jon Poverelli. In A3, Volz got the holeshot but soon dropped back to third, where he remained for the rest of the race. That left Hughes and Stallings to battle it out. Hughes showed the experience it takes to drive clean under pressure. By the fourth lap, he seemed to put his vehicle into cruise control to secure the win and wrench the overall win from Stallings.

4WD Mod. Steve Moore and his Losi held the TQ with a lap over the rest of the field. By the time the A1 and A2 had finished, Moore had already secured the big trophy, and Anthony Pena and Brian Jetter, both running Losi buggies, came in second and third. In the final A-main, Moore used this time to have fun with the other guys. He went unchallenged for the win. Jetter finished second, two laps down to Moore, but he still earned the right-hand place on the podium.



Buggies gridded up for the last triple A-main.



Above top: drivers show their "game faces" as they try to get to the A-main. **Above bottom:** Tracey Macomber, Charlie Barnes, Angie Grodell and Princess running the Classic from the timing tower.

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SPORTSMAN AND
STOCK-CLASS
COVERAGE
ONLINE

**4WD Modified**

FIN.	QUAL.	DRIVER	CHASSIS	MOTOR	BATTERY	ESC	RADIO	TIRES
1	1	Steve Moore	Team Losi	Banzai	Pro-Match	Novak	Futaba	Team Losi
2	4	Brian Jetter	Team Losi	*	*	*	*	*
3	2	Anthony Pena	Team Losi	Reedy	Trinity	Novak	Airtronics	Panther
4	3	Shawn Bowie	Yokomo	Reedy	Reedy	LRP	JR Racing	*

Modified Truck

1	1	Mike Kendall	Team Losi	Orion	Orion	Novak	Airtronics	Team Losi
2	6	Jonah Gallant	Associated	Reedy	Pro-Match	LRP	Airtronics	Losi/Pro-Line
3	2	Kyle Stallings	Associated	Reedy	Reedy	LRP	Airtronics	Pro-Line
4	7	Jeff Wittman	Team Losi	Putnam	Nuclear Power	LRP	Airtronics	Losi/Pro-Line
5	4	Pat McCarson	Team Losi	Peak	Peak	LRP	Airtronics	Team Losi

Sportsman Truck

1	2	Aaron Lane	Team Losi	Handout	Epic	Keyence	Hitec	Pro-Line handout
2	1	David Burnell	Team Losi	Handout	Peak	Novak	Airtronics	Pro-Line handout
3	4	Steve Moore	Team Losi	Handout	Pro-Match	Novak	Futaba	Pro-Line handout
4	3	Coy Limon	Associated	Handout	Yokomo	Novak	Airtronics	Pro-Line handout
5	6	Keith Whisler	Team Losi	Handout	Peak	Novak	KO Propo	Pro-Line handout

Stock Buggy

1	1	Aaron Waldron	Team Losi	Trinity	Trinity	Novak	Airtronics	Panther
2	2	Jeff Barrett	Team Losi	Orion	Orion	Novak	Airtronics	Team Losi
3	3	David Richards	Team Losi	Peak	Orion	Novak	Airtronics	Team Losi
4	4	Ryan Harbison	Associated	Orion	Reedy	Novak	JR Racing	Pro-Line

*Information not supplied by driver

READY TO ROOST!



SWIFT

READY-TO-RUN 1/8 NITRO BUGGY



		Stock Truck						
FIN.	QUAL.	DRIVER	CHASSIS	MOTOR	BATTERY	ESC	RADIO	TIRES
1	1	Aaron Waldron	Team Losi	Trinity	Trinity	Novak	Airtronics	Panther
2	3	Mike Kendall	Team Losi	Orion	Orion	Novak	Airtronics	Team Losi
3	2	Jeff Barrett	Team Losi	Orion	Orion	Novak	Airtronics	Team Losi
4	4	Mark O'Neill	Team Losi	Orion	Orion	Novak	Airtronics	Panther

		Modified Buggy						
1	2	Scott Hughes	Associated	Reedy	Reedy	LRP	KO Propo	Pro-Line
2	1	Kyle Stallings	Associated	Reedy	Reedy	LRP	Airtronics	Pro-Line
3	5	Jared Volz	Team Losi	Banzai	Pro-Match	Novak	Airtronics	Pro-Line
4	4	Jon Poverelli	Associated	Banzai	Pro-Match	LRP	Airtronics	Pro-Line
5	3	Jonah Gallant	Associated	Reedy	Pro-Match	LRP	Airtronics	Pro-Line

		Sportsman Buggy						
1	4	David Burnell	Team Losi	Handout	Peak	Novak	Airtronics	Handout
2	3	Eddie Trammell	Team Losi	Handout	Orion	Novak	Airtronics	Handout
3	5	Lerone Hearn	Associated	Handout	Reedy	LRP	Airtronics	Handout
4	2	Brian Losey	Associated	Handout	Epic	Novak	Airtronics	Handout
5	1	Mike Fox	Team Losi	Handout	Pro-Match	Novak	Airtronics	Handout

*Information not supplied by driver



Left: Pro-Line's Scott Hughes in the pits preparing for his Main.

Right: taking a break between the rounds.

Congratulations to Pro-Line and the Endless Summer Classic sponsors, coordinators and winners for good racing and a great time. The Pegasus staff, along with race director Charlie Barnes, put on an excellent show, and everyone had a good time on the challenging track. Rest assured, the Endless Summer Classic will be back in '04, and Pro-Line may come up with a few surprises to make it even bigger and better. Be there! ■

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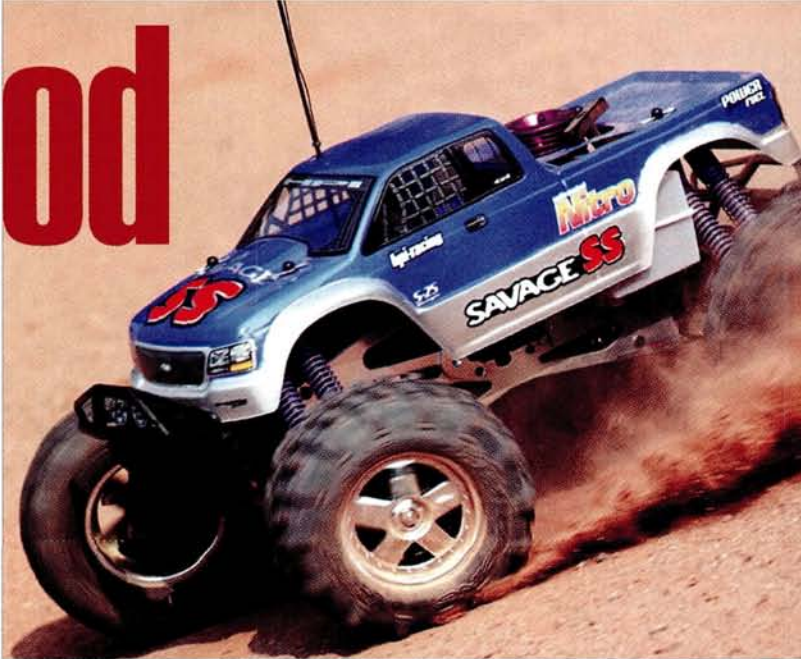
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how to hot rod your engine

Free horsepower! by Steve Pond

Mark Donahue, the famous Can-Am and Indy racer from the '60s and '70s, coined the term "unfair advantage"; it describes what people have when they've explored every angle to gain a legal advantage over the competition. It's part of the competitive spirit that drives racers to push all the limits to be the fastest. It's the same kind of spirit as motivates the writers of the thousands of letters, emails and posts on bulletin boards who ask what can be done to a nitro engine to get more power out of it.

Modifying a nitro engine can be simple or complex, depending on your goals. The simple modifications smooth and increase the flow of the air/fuel mixture inside the engine, while the complex variety affect timing and other critical parameters. Leave the complex mods to the pro's; with basic tools and patience, you can achieve the horsepower gains you've been looking for.



warning!

- All warranties go out the window the moment a grinding wheel touches any part of your engine.
- No matter how simple the modification, you run the risk of slipping up and doing irreparable damage to your engine. If you consider your engine sacred and would suffer great pain if you accidentally trashed it, stop reading now.
- Never change the interior dimensions of the ports. Carelessly enlarging these ports or "port-matching" them to the block will NOT make your engine more powerful. Modifying port timing, shape and volume is a job for the pro's, and it's much easier to get wrong than it is to get right. Stick with the mods shown in this article.

you'll need

- Rotary tool with stone and carbide grinding bits, polishing bits and polishing compound
- Small hand files
- 400- to 600-grit sandpaper
- Spray nitro cleaner
- WD-40 spray lubricant
- Marvel Mystery Oil or after-run oil



IS YOUR ENGINE MOD-WORTHY?

"Sport" and middle-line engines stand to gain the most from a little "massaging" of their internal components; potential gains are as high as 15 percent in sport engines and as little as 5 percent in higher-performance engines. High-performance engines have already been optimized, so they will see little gain from the types of modifications discussed in this article. If you already have a factory-modified engine, just leave it alone; there isn't anything you can do to it that hasn't already been done.

Clean your engine fully, then tear it down to the sleeve and bare engine block.



1 COMPLETELY CLEAN AND DISSASSEMBLE YOUR ENGINE You'll only be modifying the sleeve, but you should also keep the engine block handy so you can check port alignment between the sleeve and block. Store the other parts where they won't be contaminated by metal filings and other debris. Do your best to keep the block free of contamination as well because the crankshaft bearings are easily damaged by debris.

2 IDENTIFY THE PORTS IN THE SLEEVE The exhaust port is obviously aligned with the exhaust flange in the engine block, and it's always the highest port on the sleeve. The port(s) opposite the exhaust are referred to as the boost port(s), and the ports on the side of the sleeve are usually the transfer or "Schnuerle" ports. Some engines have additional ports surrounding the transfer ports; these are guide ports.



Note the position of the exhaust port (arrowed) as you remove the piston sleeve from the engine block. This will later help you identify the other ports in the sleeve. Without getting into the details of why modifying the exhaust port can be a bad idea, suffice it to say that you don't want to touch the exhaust port in any way.



Boost port

The boost port is opposite the exhaust port. The boost port guides some of the intake charge straight up toward the top of the cylinder and away from the exhaust port. The movement of the intake charge pushes the residual exhaust gases downward and out through the exhaust port. In most engines, the boost port has a much sharper upward angle than the other transfer ports, but it can benefit from a little attention, too.



We won't mod the exhaust port (A), but shaping the entrance to the transfer (Schnuerle) ports (B) helps the air/fuel mixture to flow more smoothly. The transfer ports are at 90 degrees to the exhaust and boost ports and aimed toward the back of the cylinder. They pump fresh air/fuel mixture into the cylinder. The intake charge enters the transfer ports and is forced to the back of the cylinder where it's then pushed upward by the boost port.

3 RADIUS THE BOTTOM OF THE SLEEVE Inspect the bottom edge of the piston sleeve. If you find a square edge or only a small radius, round it to smooth the flow of the air/fuel mixture as it flows past this area and up into the transfer ports. Begin by rounding the bottom edge of the sleeve on its outermost surface (as shown). A fine-grit sanding drum on a rotary tool will usually do the trick. Keep the tool's speed as low as possible so you only remove a little material at a time. You can also use a flat metal file, but be very careful not to touch the inside of the sleeve.

After you've established the general shape with the sanding drum, use a rubberized polishing bit to clean up the surface; 600-grit sandpaper can be used if you don't have a power tool. The finish work should be clean and smooth so the air/fuel mixture can flow as smoothly as possible.



Use a fine-grit sanding drum or a carbide cutting bit to round the outer bottom edge of the piston sleeve. Follow that with a rubberized abrasive bit, and then finish with a felt polishing bit and polishing compound for a smooth finish.



The finished lower edge of the sleeve has a smoother, more rounded outer edge, and that will improve flow in this area.

4 SMOOTH THE BOOST PORTS Turn your attention to the boost port(s). There may already be a smooth transition because of the ports' sharp upward angle, and they may not need additional work, but boost ports that have been cut straight into the sleeve can benefit from a little beveling. Grind the outside of the sleeve at an angle that points to the top of the cylinder (as shown). Use a long, narrow stone or a carbide grinding bit at low speed to avoid clogging the bit. Work only on the outside surface of the sleeve; DO NOT grind on the inner edge of the port for any reason. This will change port timing and may have a negative effect on performance.



Knock the sharp edge off the outside of the port to smooth the flow of air/fuel mixture into this port.



A rubberized polishing bit creates a smoother finished surface for better flow.



The finished boost port should look like this on the outside, but its inner surfaces should remain untouched.

5 TRANSFER- AND GUIDE-PORT MODS The transfer/Schnuerle ports don't require as sharp an upward angle as the boost port. These ports are angled more toward the back of the cylinder where the boost port is, and they may have a slight upward angle. A small radius is normally all you need to add here, but there's an alternative to that modification: you can instead shape the outside of the sleeve to create the effect of a guide port. Use a rotary tool or a round file to create a groove (as shown) on the side of the port that's closest to the exhaust. This groove will guide some of the air/fuel mixture up toward the top of the cylinder much like a guide port. This type of modification is more challenging to do, and although the groove isn't as effective as two separate ports, it can create a similar effect.



Sharp edges on the transfer (Schnuerle) ports create a lot of turbulence that disrupts flow through these critical ports. Use a carbide bit or small hand file to bevel and smooth the lower edges; just a slight bevel will do the trick.



Use a carbide cutter or a round hand file to form a groove-shaped "guide" port. This isn't a true guide port, but it does help to direct the flow of air/fuel mixture away from the exhaust port more effectively. For the most significant gains, match the angle of the guide port to that of the transfer passage cast into the block. This particular engine has a vertical transfer passage, so the side of the guide port is cut to match.



The transfer port on the other side of the sleeve is given a similar treatment. Note that both transfer ports are angled away from the exhaust port. Touch up both transfer ports with a rubberized polishing wheel.

6 CLEANUP Thoroughly clean the sleeve with a liberal dose of nitro cleaner, and then hit it with compressed air. Do this a couple of times until you're certain there are no metal flakes left on the sleeve.



Make certain all filings have been removed before you reassemble the engine.

7 BACK IN ACTION

Liberally spray the sleeve and the other engine components with WD-40 to get rid of any moisture, and then reassemble the engine. Use Marvel Mystery Oil or after-run oil on the bearings, the sleeve and other "friction" surfaces to ensure they're well lubed for startup.

Carefully reassemble the engine and install it in your vehicle. Get ready for more power!



Beware of "Nexperts"

Pro engine tuners such as JP Racing, Paris Racing, KHM and other suppliers of factory-modified engines with championship-winning credentials can be trusted to make advanced engine mods, but be careful of Net experts, or "nexperts" who offer their "professional" porting services on the Internet. Extensive performance porting work beyond what you see in this article requires precision instruments to measure when combustion events occur inside the engine. Without the information provided by these special instruments, there's no way these overly ambitious "experts" can map out effective mods. If a potential tuner can't give you precise information about how and why he's modifying the timing events inside your engine, for example, "The exhaust is currently at X degrees, and I will change it to Y degrees to increase maximum rpm," he has no business making modifications any more extensive than those you can do for free as shown in this article. If an engine tuner is uncomfortable giving you detailed information about what he plans to do with your engine, you should be wary about giving him your engine AND your money.

SOURCES

JP RACING distributed by Mugen USA (949) 707-5607; mugenracing.com.

KHM NOVAMEGA ENGINES distributed by Serpent Inc. USA (305) 639-9665; serpent.com.

PARIS RACING (909) 465-1189; parisracing.com.



how to Shake it up with Spray cans

by Josh Thiel

Whether you're a new hobbyist or a seasoned pro, spray cans offer an inexpensive, convenient and simple way to paint a body. Unfortunately, these qualities can limit your paint jobs unless you incorporate specialized painting techniques to get the most out of spray-can use. Get ready because we'll use spray cans to demonstrate that you don't need an airbrush for a trick paint job.

BEFORE YOU SPRAY

Before the paint has started to fly and you have three coats of overspray on your hands, keep a few technical tips in mind:

■ **SPRAY CANS ARE MESSY.** When you press that button, you should expect to spray a lot of paint—and not just where you plan to spray it. Because of this, you need to be especially sure that the body is carefully masked.

■ **TAKE THE APPROPRIATE SAFETY MEASURES** to protect yourself both from direct spray and airborne overspray. You should wear gloves, eye protection and a face mask. Always spray paint in a well-ventilated area that is completely free of anything you don't want to get paint on.

■ **SPRAY-CAN NOZZLES ARE PRONE TO PAINT BUILDUP AND CLOGGING**, and a partly clogged nozzle will result in spotty and uneven spray patterns. For a well-atomized, even spray, wipe the nozzle frequently so that paint doesn't build up.

■ **SPRAY-CANS WORK BEST AT TEMPERATURES OF 70° F OR HIGHER.** If you plan to spray in especially cold weather or if your cans are cold, let them sit in warm water (never more than 120° F) to improve the spray quality.



To prevent the spray nozzle from getting clogged and causing the paint to spatter (or not spraying at all), when you've finished spraying, invert the can, and spray the paint onto newspaper until it stops coming out of the nozzle.



Here's an HPI Nissan 350Z Nismo GT shell; I've laid down my design, and I'm ready to go.



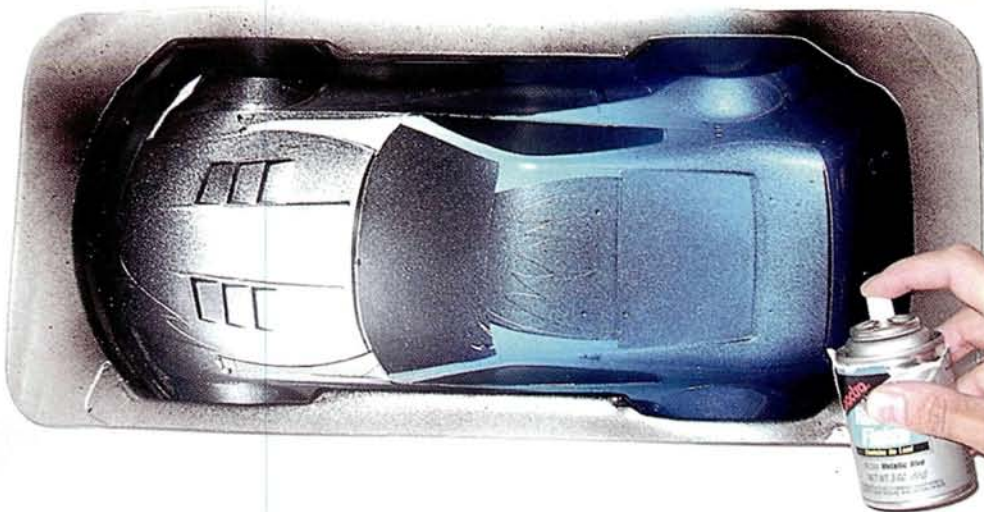
For an optimum "spray," shake the spray can well to mix the paint, and soak its base in warm water before you start to paint.

SPRAYING BASICS

Just pushing a button for paint is about as simple as it gets, but there are a few ways to get better results:

■ **INSTEAD OF SIMPLY POINTING AND SPRAYING**, move the can smoothly in even strokes across the piece you're painting. To avoid making heavy and uneven paint applications, start spraying before the can is over the body, and stop spraying when the can has passed the area you're painting. Even with this method, you shouldn't try to cover a section in one pass; apply several thin coats, and you'll avoid paint pooling and bleeding.

■ **THE DISTANCE BETWEEN THE CAN AND THE SURFACE** to be sprayed and the angle at which you spray also affect spray pattern and quality. Spray width can be altered (up to a point) by moving the can closer to or farther from a surface. Changing the spray angle and direction can further control "fade" patterns; for a tighter fade, paint at a shallow angle away from an open area or into an area for a more gradual fade.



For a gradual fade, spray at an angle into an open area. The distance and angle at which you hold the can will affect the spray pattern.

ADVANCED TECHNIQUES

If there's a trick to using spray cans to achieve cool effects, it's that you can manipulate a can's set spray pattern to create the effect you want. With an airbrush, you can directly create any sort of wild pattern, but spray cans require innovative masking if you're to achieve a more creative effect. Try the techniques listed here, or modify them to suit your particular needs:

■ **FADED LINES.** A basic and often used effect is a simple faded line. For a sharp-edge line, cut a line pattern out of the masking that you use, spray the paint lightly, and pull the can away as you approach the line. How gradual the fade is depends on when you start pulling the can away from the surface; for a more gradual fade, pull it away sooner. Make sure that you paint the darker of the two colors used in the fade first.



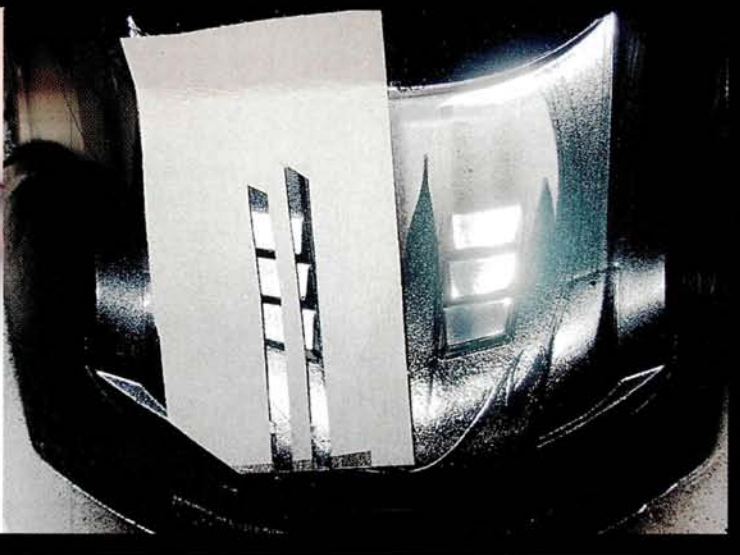
See the difference between the soft-edge fade (left) and the hard-edge fade (right) on the lines shown here?

Hard edge



To create a fade with a hard, well-defined edge, cut out only the area on which you want the fade, and spray along the line while slowly pulling the can away.

soft edge



For a soft-edge fade, cut a pattern of the faded design out of heavy paper and lay it over the entire exposed area. Paint spray will sneak under the paper and create a soft edge.

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Revolution HP-CR.....	100	59
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H Set (SINGLE ACTION)	\$77	\$42
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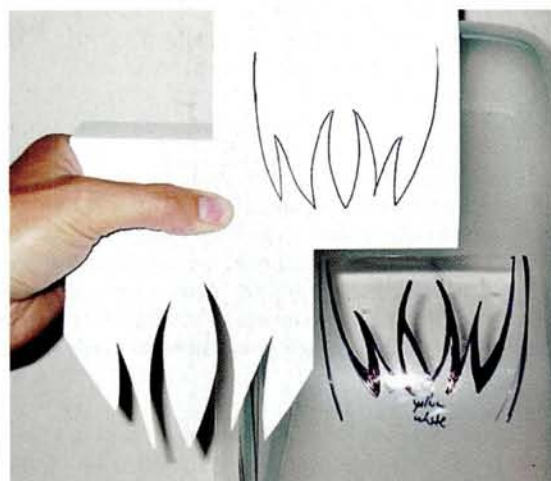
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Check out this yellow to white fade on the side of the 350Z. You don't need an airbrush to get super-tight faded lines.



When creating drop shadows, hold the mask slightly off the body, and spray into the base.



Drop shadows add dimension to any paint job. Just as if you were doing a fade, use a piece of card stock or a similar heavy paper to create the drop shadow. When you add a drop shadow to a flame, trace and then cut out a copy of the flame design.

■ **TIGHT FADED EDGES.** Make these by holding a straight piece of heavy paper slightly above the surface while spraying paint away from its edge. The paper limits the amount of paint that hits the body's surface, but overspray will go under the paper and create a fade. The closer the paper is to the surface, the tighter the faded line will be.

■ **DROP SHADOWS.** Many graphics have detailed drop shadows that follow their lines. Although these are usually created with an airbrush, you can still use a version of the methods previously described to obtain a similar effect. You can sketch the graphic on heavy paper, cut it out and use it as a partial mask. Hold it on the surface, but offset it from the body's original graphic, and lightly spray the base to easily make drop shadows.

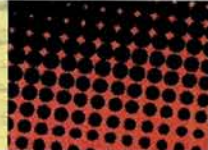
CONCLUSION

If you think that spray cans have limitations, you're wrong; you're really only limited by your imagination. Use it, and in no time, you'll be able to whip up some results that look as if you used an airbrush. Impress your friends with your spray-can skills, or maybe just keep them guessing. Either way, have fun!

SOURCES

PACTRA INC. distributed by Testor Corp. (815) 962-6654; testors.com.

TAMIYA AMERICA INC. (800) 826-4922; tamiausa.com.



The Slayden Setup

How to make your Maxx faster!



Steve Slayden is Traxxas' in-house Maxx master.

Welcome to the first installment of "Maxx Overdrive"—a new column devoted exclusively to Traxxas Maxx trucks. Why give the Maxx trucks their own column? Simple: thousands of you guys have 'em, most of the new products that come through RC Car Action are for them, and our in-boxes are always filled with questions about them. So here it is—your first monthly dose of Maxx action!

The T-Maxx wasn't designed as a racing vehicle, but T-Maxx racing is hugely popular, and finding ways to squeeze more racetrack performance out of the mighty Maxx is half the fun. We turned to Traxxas factory pilot Steve Slayden for his setup tips and tricks. He recently traveled from Texas to RC Car Action's headquarters to participate in our 1st Annual Monster Madness race, and he promptly won the small-block class. He turned laps that would have been competitive in the big-block class, so it goes without saying that his truck is dialed! Here are Steve's top tips on how he preps his Maxx for racing.



Slayden's Maxx Specs

Transmitter Hitec Aggressor CRX
Steering servo Hitec Digital HS 5945MG
Throttle servo Hitec HS 525MG
Tires: Traxxas SportTraxx (clipped down 50%)
Inserts Traxxas SportTraxx 2-stage
Body Pro-Line GMC Sierra
Receiver Hitec DCX
Engine TRX 2.5 (stock w/pull-starter)
Pipe Stock composite plastic
Plug Traxxas super-duty plug
Gearing 20T/72T (70T spur on larger tracks)
Diff fluid (F/R) OFNA 30,000WT/50,000WT

Setup	Front	Rear
Caster/anti-squat	10 deg.	7 deg.
Camber setting	-1.5 deg.	-1.5 deg.
Toe	0.5 deg. out	2 deg. in
Ride height	Arms level	Arms level
Shock body	Traxxas Big Bore	Traxxas Big Bore
Shock fluid	40WT Associated	40WT Associated
Shock piston	2-hole	2-hole
Shock spring	Kyosho white/Losi blue	Kyosho white/Losi blue
Shock internal limiters	0	0
Shock external limiters	1 shock pivot ball	1 shock pivot ball
Shock shafts	Titanium nitride	Titanium nitride
Shock position (U/L)	Middle/3	Middle/3

Additional modifications and settings

- > Traxxas machined 4mm aluminum chassis; item no.—4922X
- > Nitro Rustler fuel tank—4448
- > 5x8 ball bearings in steering and throttle bellcranks
- > Traxxas forward-only shaft—4994X
- > Teflon-coated aluminum pivot balls—4933X
- > Kimbrough heavy-duty servo-saver
- > 16mm spring on brake linkage for a more linear feel (from a Traxxas T-Maxx servo-saver)
- > No on/off switch; Steve uses a jumper from the battery to the receiver pack so no fuel can get in.
- > Traxxas titanium hinge pins—4939R
- > Chrome SportMaxx wheels
- > Trimmed SportTraxx tires (50-percent of the tread is trimmed off to reduce rollover on high-bite tracks).

STEVE'S TOP 10 RACING SETUP SECRETS

1 LIGHTEN UP! First and foremost, Steve stresses the importance of making the truck as light as possible. "You'll see that I've retained most of the stock plastic parts on my truck. Not only do they 'give' a little, but they're generally lighter as well." Steve says he finds that the plastic parts are much more durable than people realize. "Not only are the plastic parts durable, but you also don't have to worry about screws backing out of your parts or need to use Loctite on every single piece of your truck."

2 SLICKER SUSPENSION. One of the most important mods on Steve's truck is the addition of a full set of Teflon-coated aluminum pivot balls (item no. 4933X), "I highly advise using them," says Steve. "They make the truck handle consistently better, you get improved suspension movement and performance, and you also get better steering response."



Steve uses a combination of Kyosho 1/8-scale buggy springs (white) and Team Losi truck springs (blue).

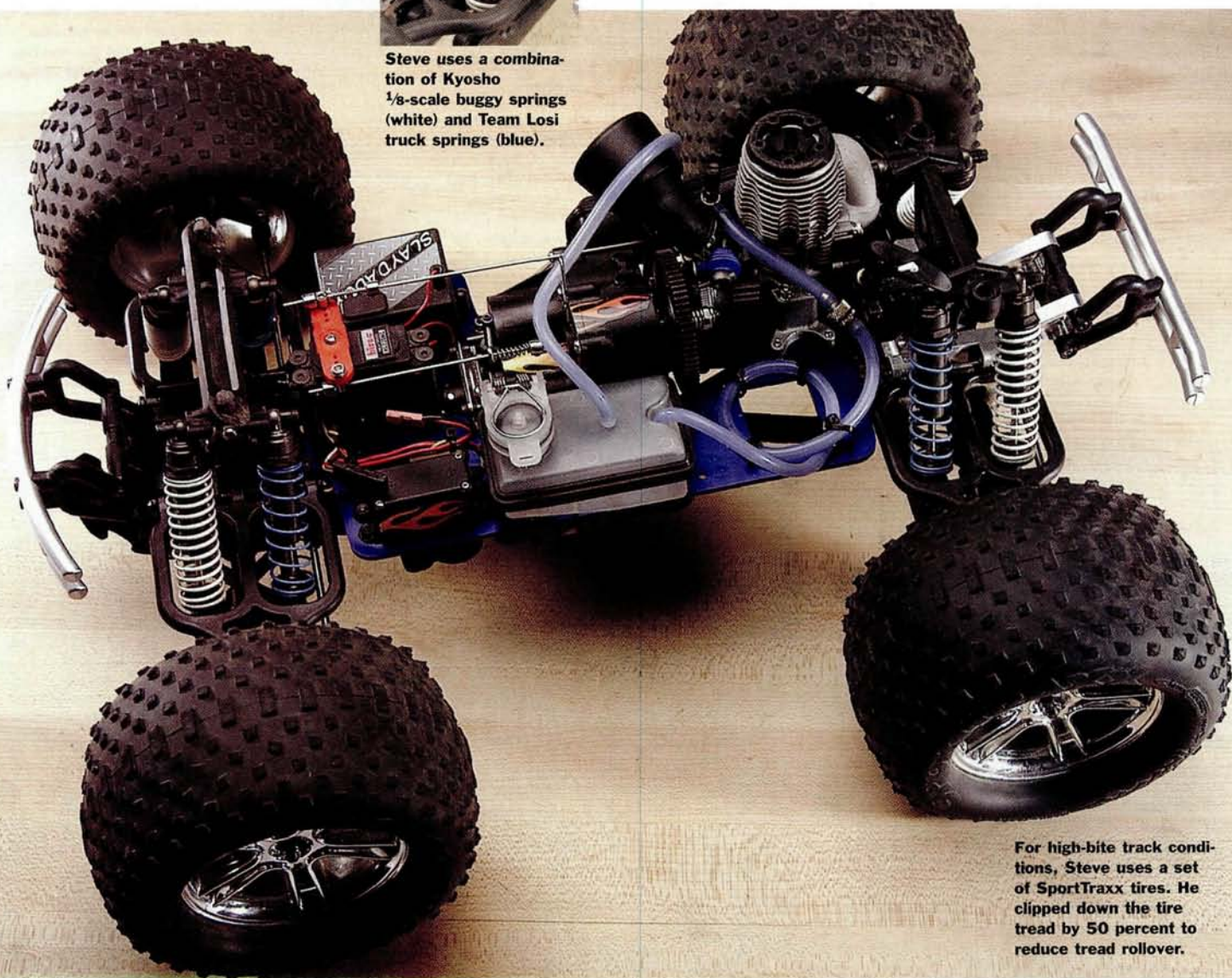
3 RUN A RUSTLER TANK.

You may have noticed that his fuel tank is different. "I use the Nitro Rustler fuel tank because it's not only less vulnerable to crash damage, but it

has better fuel pick-up and a lower center of gravity as well." Interestingly, there's also another benefit to running this tank, which Steve explained: "I found that when you run a big tank like the stock T-Maxx tank and the fuel is up higher than the carb, your needle settings can change slightly as the fuel level starts to go down. With a full tank, the engine runs a little rich, but it will gradually lean out as the fuel reaches the bottom of the tank. It isn't a huge deal when you're out bashing around, but when you're racing and need a consistent tune from the start of your race to the end, it can play a big part in your race. When you run the lower-profile Rustler tank, you can tune your engine on a full tank for optimum power and have your settings be consistent as your fuel runs low."



A low-profile Nitro Rustler fuel tank sits in place of the stock tank. The tank is less prone to cracking in a rollover, and it helps the engine maintain a more consistent tune.

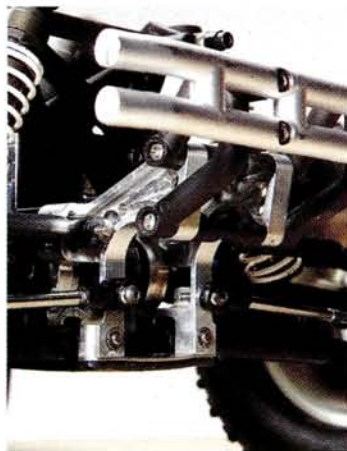


For high-bite track conditions, Steve uses a set of SportTraxx tires. He clipped down the tire tread by 50 percent to reduce tread rollover.

4 LOSE REVERSE. Steve uses the stock tranny with stock gears with one exception: "The only difference is that I don't run the reverse setup." He uses the Traxxas forward-only shaft (4994X).

5 BIGGER BRAKES. "I use 1/8-scale on-road brake pad material glued to the pressure plates [two plates per side] to reduce fatigue and give the truck more consistent brake pressure. I found that it helps with overall brake power; they transition better from the light brake feel up to full lock. And it's smoother, too." Steve also uses a spring from a servo-saver in place of fuel tubing on the brake linkage and a custom-machined steel brake disc. "With the combination of the spring and the metal disc, the brakes are just supersmooth all the way up to full brake."

6 ROLL-CENTER REPOSITIONING. Steve's truck has a custom aluminum rear bulkhead with three roll-center adjustment positions. The lowest position raises the roll center and reduces roll the most. Steve uses this setting on really high-bite tracks and tracks where the truck can carry a lot of speed. He uses the middle setting most often. It helps to keep the front end down so the truck doesn't roll over easily. The highest position is the same as the "stock" position on a regular T-Maxx.



A custom rear bulkhead has three settings for altering roll center. The top position matches the stock T-Maxx's setting in case Steve needs to use the stock setting as a benchmark.

7 SILICONE DIFFS. Steve fills his Maxx's diffs with OFNA silicone diff fluid (30,000WT in the front and 50,000WT in the rear). He runs the heavier fluid in the rear to gain more on-power steering, but if the track is slick or really rough, he switches to a slightly lighter fluid in the back.

8 STANDARD SLIDERS. To get the power to the big wheels, Steve stuck with the standard telescoping drive shafts. "They're lighter and you don't have to really maintain them. They work well with the power output of the TRX 2.5."

9 BUMPER BODY MOUNT. A unique, custom body-mount system sits on the back of his truck. "The GMC body I run tends to crack a bit, so I made a brace out of a spare T-Maxx bumper. It holds the body mount on the body to better brace the sides and the back. The brace prevents the body from bending; it's not that the body isn't made out of durable Lexan—it's the bends. When the body flexes and stresses, it just cracks around those bends. I recommend that you either Shoe-Goo the body, or make a brace like I did; the body will last much longer."



To help prevent the back of his truck's body from cracking, Steve made this unique body-mounting system out of a spare Maxx bumper.



10 LOW-SLUNG RECEIVER PACK. To lower the center of gravity as far as possible, Steve mounted his receiver pack underneath the chassis.

To keep the truck's center of gravity as low as possible, Steve mounted the receiver pack underneath the chassis.

Steve keeps the bone-stock TRX 2.5 engine and composite pipe in his Maxx. To save weight, he replaced the stock EZ-Start system with a pull-starter.



MAXX SWAG



WERKS/PICCO "MEDIUM-BLOCK" MONSTER P2 .21

If you want to add more power to your Maxx but don't want to get a full-blown .21 conversion kit, then look no further! Picco has a new .21 (3.5cc) Monster P2 engine designed specifically to fit the Traxxas T-Maxx without modifications or conversion parts. The new engine uses a slightly larger "medium-block" to achieve the .21 (3.5cc) displacement, and it comes with a new mount to install the engine directly into the T-Maxx. A header mounting system similar to that which is used on the TRX 2.5 engine is used on the Monster P2 engine, so your stock exhaust system will be a direct fit. The engine is available with a pull-starter, or you can install an EZ-Start 2; it's a direct fit on the Monster P2.

Monster P2 .21 engine; item no.—WRXP2M21; \$190.

Werks Racing (408) 365-1000; werksracing.com.

SOURCES

HITEC RCD INC.
(858) 748-6948;
hitecrad.com.

KIMBROUGH PRODUCTS
(714) 258-7425;
kimbrough-products.com.

OFNA RACING
(949) 586-2910; ofna.com.

PRO-LINE (909) 849-9781;
pro-lineracing.com.

TEAM ASSOCIATED
(714) 850-9342;
teamassociated.com;
rc10.com.

TRAXXAS CORP.
(972) 265-8000;
traxxas.com.

WERKS RACING
(408) 365-1000;
werksracing.com.



4x4

the truck stops here

BY KEVIN HETMANSKI

Ripper-izing the TXT-1

Thunder Tech Racing's Ripper is one of the best chassis and suspension kits available for monster-truck racing—but only if you run a Tamiya Clod Buster.

That's all about to change now that Thunder Tech has retooled the Ripper design to suit the TXT-1—Tamiya's latest solid-axle electric powerhouse. The new, much lighter chassis carries the battery pack at its bottom to dramatically lower the truck's CG, and the suspension has been reconfigured for greater articulation with shorter, lighter shocks.

Interested?

parts list

CHASSIS

THUNDER TECH

- TXT-1 Ripper—item no. RIPP-02; \$295

SUSPENSION AND STEERING

NEW ERA

- TXT-1 lower supports—TXT822; \$39.95

ASSOCIATED

- Hard-anodized shocks—7408, \$26.99/pair
- B4 spring set

DRIVE TRAIN

ACER RACING

- Ceramic Nitride Pro Series bearings—kitscerm96; \$113

GOLDEN HORIZONS

- Aluminum diff housing, TXT-1—1212; \$18.40

ELECTRONICS

AIRTRONICS

- 94358Z ERG-VR servo—94358Z; \$104.99

NOVAK

- Super Sport brushless system—3005; \$235
- Switch for Airtronics M8 (75MHz)—2680; \$110
- Xtra receiver (75MHz)—2675; \$95

FANTOM

- 7-cell battery pack (custom)—\$70

BODY AND TIRES

IMEX

- Truck Pull tires—7595; \$30/pair

PRO-LINE

- Chevy Suburban—3112-00; \$28

Tamiya TXT-1—58280; \$360

Total: \$1,477.72



WHAT YOU GET

THE RIPPER KIT FOR THE TXT-1 INCLUDES

- Carbon-fiber side plates
- Machined-aluminum cross-members, lower arms and swaybar arms
- Plate-aluminum, upper-shock mounts
- G-10 fiberglass radio tray
- Traxxas E-Maxx drive shafts



O-rings grab the Phantom 7-cell pack. Note the burly sway bar arms.

FRAME FEATURES. You can get the Ripper in traditional black weave or the fashionable silver that I chose. The battery fits through a slot at the bottom of the chassis and is held by O-rings, and 6-, 7-, or 8-cell packs can be used. The standard Ripper kit is ready to accept the TXT-1's center tranny, but Thunder Tech offers an optional E-Maxx tranny kit for the chassis. A cutout for the shifter servo comes in the stock top plate.



Thunder Tech's Ripper combines the TXT-1's stock upper arms with new lower arms. They are machined out of solid-aluminum billet and have multiple shock-mounting positions.

SUSPENSION TECH. The Ripper uses the stock TXT-1 upper arms, but Thunder Tech's unique lower arms replace the stockers. They're machined out of aluminum billet and have slots cut in their centers for mounting the shocks and swaybars. Three shock-mounting positions are available on the lower arms while the chassis has three positions to offer. You can use any 3-inch-long shocks on the market, but I used a Team Associated hard-anodized set because Thunder Tech's racers use them on all their trucks, and using the same shocks makes it easy to duplicate their setups. And, most important, Associated simply makes great shocks.

The swaybars consist of three pieces: two arms and a rod. They are mounted low and ride on bushings, and a short linkage connects them to the lower arms. I set up all four shocks with number 1 pistons, and I used 75WT fluid in the right rear shock and 50WT in the rest. The 75WT fluid reduces the chassis tweak when you nail the trigger. Red springs support the truck's rear, and silver springs take care of the front end.

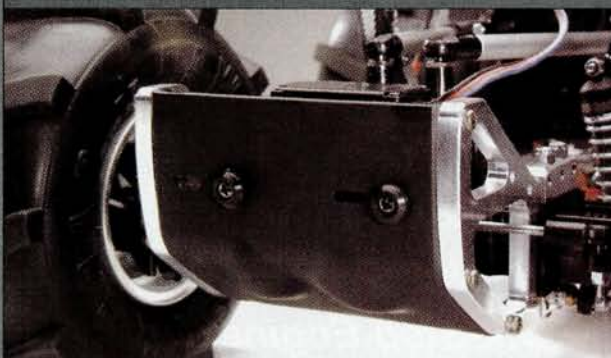
MAXX-IMUM DURABILITY. Thunder Tech includes a set of Traxxas E-Maxx universal drive shafts with the Ripper kit. They're much lighter and smoother than the stock TXT-1 units, but they're too long to fit properly. No worries! Thunder Tech's instructions tell you just how much to cut off them. I used a Craftsman Accu-Cut to do the job; it's a great tool.

other mods

NO-FLEX BUMPERS. The TXT-1's steering servo is mounted on the front skidplate, which is connected to the front bumper. When the front tires put pressure on the servo, it causes the bumper to flex, and that makes the steering less responsive. I replaced the stock bumpers with a set of aluminum ones from New Era; they don't flex, and they can take a beating.

STRONGER STEERING. I plan to race this truck, so I installed a killer servo to move those big tires: an Airtronics 94358Z. It puts out 200 oz.-in. of torque at a transit time of 0.10 second.

BETTER BEARINGS. The more freely your drive train runs, the faster your truck will go, so I installed a set of Acer Racing Super Polyamide bearings. According to Acer, the polyamide material has a lower rolling friction than any other seal.



The aluminum bumper supports are from New Era, and a high-torque Airtronics servo muscles the IMEX front tires.

DIFF DIET. The TXT-1 is a bit on the heavy side, and much of that weight comes from the metal gears in the axles. I replaced the stock diff housings with aluminum ones from Golden Horizons. I was able to save 68 grams just by changing the diff housings!

JOSH'S HOT BODY. I like the looks of the stock body that comes with the TXT-1, but this is a project truck. I couldn't use the stock body! Our Body Shop guy Josh Thiel painted a Pro-Line Chevy Suburban body just for the Ripper.

OLD WHEELS, NEW TIRES. The stock wheels are just too cool to toss aside, so they made the cut, but I shod them with a set of IMEX Puller tires. These tires are light, provide great traction and look good.

THINK NITRO



RIPPIN' UP THE RIPPER

I've raced a slightly modified TXT-1 a couple of times; it had a ton of body roll, and it torque-steered off the line. The Ripper eliminates these tendencies and launches straight and fast. The inline-mounted motor tweaks the chassis slightly as it torques the transmission, but the suspension absorbs these forces and eliminates the need to countersteer off the line. It's also extremely quick. Brushless power, a nearly frictionless drive train and a whopping 40.3-ounce weight reduction. It's easy to understand how the Ripper can accelerate like a mod-class touring car.

I'm very happy with brushless power. The Super Sport motor/ESC combo's power delivery is very smooth and has all kinds of torque that helps the Ripper blast from corner to corner. The toughened steering system hauls the truck through the turns, and the swaybars do their thing to prevent the chassis from wallowing. Even jumping is improved, since there's less weight for the suspension to handle. There's just a little rebound on landings instead of a tire-flattening ka-bong, and the Ripper stays on its line. It's fun to bomb around with a truck that's this well-sorted, but the Ripper's real mission is racing. At the 2004 Westchester Radio Aero Modelers' show (Westchester, NY), I'll test it in competition. If you show up to race, good luck!

SOURCES

ACER RACING (310) 472-8090; acerracing.com.

AIRTRONICS (714) 978-1895; airtronics.net.

FANTOM RACING (269) 649-9583; fantomracing.com.

GOLDEN HORIZONS ENTERPRISES CO., LTD
(604) 331-2526; ghhobby.com.

IMEX MODEL CO. (352) 754-8522; imexrc.com.

NOVAK ELECTRONICS INC. (949) 833-8873;
teamnovak.com.

PRO-LINE (909) 849-9781; pro-lineracing.com.

TAMIYA AMERICA INC. (800) 826-4922; tamiyausa.com.

TEAM ASSOCIATED (714) 850-9342; teamassociated.com.

THUNDER TECH RACING (815) 467-0621; thundertechnracing.com.

UNLIMITED ENGINEERING unlimitedengineering.com.

brushless power

There's nothing wrong with brushed motors. They provide monster trucks with all kinds of stump-pulling power and good top end. The only downside is that they need a lot of maintenance to keep them running in peak form. This is where brushless motors are different; they require zero maintenance and are also very efficient. Novak's Super Sport brushless system has the feel of a standard ESC and brushed motor and was designed for standard 540 motor applications. When you set up the ESC, you can choose from six throttle programs: standard, high and sportsman. The programs are available with and without reverse; I set my truck up with the sportsman setting; it offers unlimited rpm and acceleration, a high minimum brake and reverse.

The Novak brushless system is sweet! It's very smooth and has enough torque to launch this big truck off the line.



TRICK TRUCK STUFF

Unlimited Engineering offers a heavy-duty transmission kit for you power-hungry Maxxers out there. It's a forward-only setup that includes new 8mm machined gears with 2-speed and output shafts.

**Hardened-steel
forward-only
conversion—
UE13470; \$99.99**



TALK TRUCK!

Send your "4x4" questions and comments to Kevin Hetmansi, kevinh@airage.com.

THINK XRAY

SPRING 2004

XRAY



piston power

expert engine advice

BY STEVE POND

"Ready-to-run" doesn't mean "Maintenance-free"



Sure, it's looking good now, but after a few runs, your RTR will need some TLC.

Ready-to-run nitro vehicles are more popular now than ever, and it's a very good thing: they've opened the door to tons of new nitro bashers who might not otherwise have become involved. But many RTR owners don't know much about the internal workings of their vehicles because they didn't build them. They therefore have more difficulty recognizing and solving problems. Eventually, we all have to look inside our RTRs and see what's in there. They may be built for us, but that doesn't mean that they'll never require maintenance.

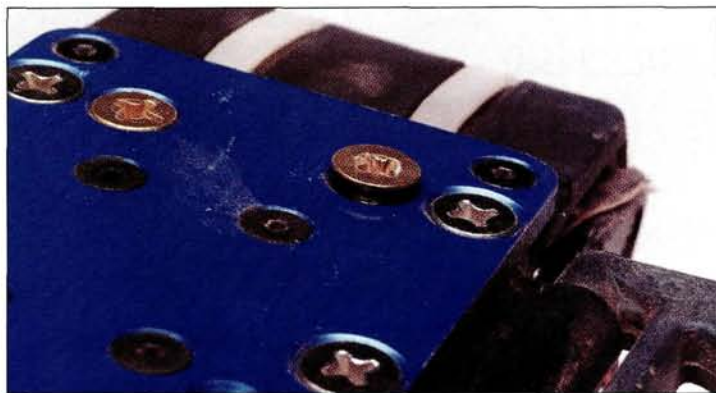
DON'T FORGET TO INSPECT

CHECK YOUR VEHICLE WHENEVER YOU RUN IT. Your checklist should include more than "Turn on the radio" (although that's a good start).

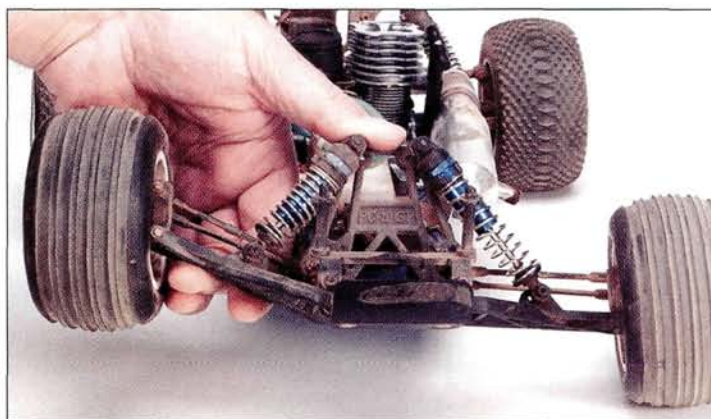
Make a common-sense checklist of parts to inspect for damage, and check other factors that may adversely affect performance.

Get into the habit of looking closely at all the moving parts. Some problems will be obvious: a rock jammed in a spur gear, for example, should act as a warning flag even to the most mechanically challenged. Here's a checklist; now you don't even have to work on that!

CHECK ALL THE MAJOR FASTENERS. Are the screws in the bottom of the chassis that hold the bulkheads, drive train and engine on the chassis loose? Depending on how often you run your vehicle, it's probably good to check them at least once a month; use a screwdriver or an Allen wrench to ensure they're snug, and before every run, at least look at them.



Screws often vibrate loose, even when they're threaded into plastic. Check the fasteners on the bottom of the chassis and in other critical areas, and you'll keep your vehicle running strongly.



Check the suspension's moving parts before you run to be sure that nothing is loose or broken. If you catch a problem now, you may avoid having other (related) difficulties that could result from the failure of just one part.

WIGGLE ALL THE SUSPENSION AND STEERING PARTS. Be sure that all the components are still firmly attached. We commonly lose small screws and E-clips, and if we don't catch this soon enough, it can result in the loss or damage of other components. Also be sure that the parts move only in the way in which they were intended to move. A suspension arm, for example, is supposed to move only up and down. If it swings backward and forward, it might indicate a broken suspension arm or mount. Also check the shock towers and mounts; the ones in vehicles that are driven really hard often break.

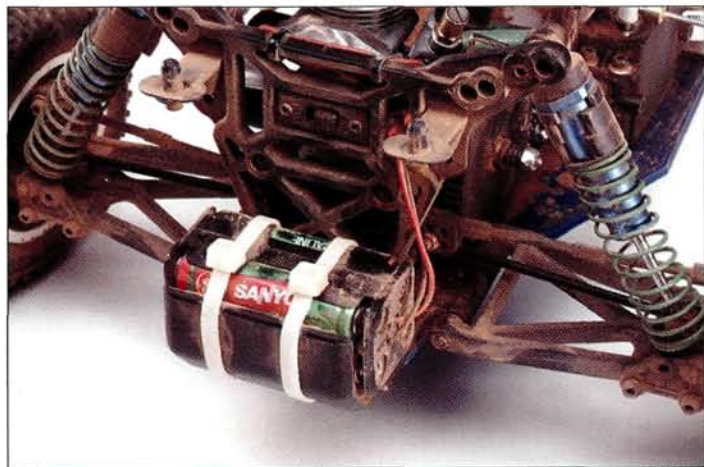
SPIN THE DRIVE TRAIN. Any degree of drive-train binding or poor brake adjustment can lead to excessive engine temperatures and poor all-around performance. Hold the car off the ground and spin the wheels.



Before you run your vehicle, check the drive train for smoothness of operation. A bad gear mesh, a faulty clutch, a bad bearing, or a brake assembly that binds can make the engine run hot because of excessive drag and friction.

There shouldn't be any resistance or tight spots; if there are, hunt for the source of each problem and fix it; if you don't, it may cause the engine to overheat or may cause clutch damage. Belt-drive systems usually offer slightly more resistance, but shaft- and belt-drive systems should both be relatively easy to spin. See the "How to diagnose drive-train woes" sidebar for more information on tracking down the source of any drive-train problem.

CHECK YOUR RECEIVER AND TRANSMITTER BATTERIES. Common sense? Yes; but failing to do it is also the most common cause of really expensive crashes. Most controllers usually have some type of meter or another way to warn you when your transmitter batteries are too low. Most RTRs, however, don't have this system for the receiver batteries. If you don't want to risk having a runaway, don't rely on average AA alkaline receiver batteries for more than two hours of run time. The receiver batteries have to power the receiver and the servos, and the latter drain them most. Monster trucks use the battery power fastest because their servos have to strain to turn those big tires.



Most RTR cars don't have a meter to tell you when the receiver batteries are low, so keep track of how long you've run with them. It's much cheaper to replace four alkaline cells than it is to replace chassis parts.

INSPECT THE FUEL AND EXHAUST SYSTEMS. Be sure that all the fuel lines are connected in the right places, and check them for cracks and slits. Such openings can intermittently allow air into the system, and that will have you chasing the "tune" on your engine forever. Fill the fuel tank, and close the lid tightly so that exhaust pressure is kept in the tank to pressurize the fuel system instead of leaking out through a poorly seated fuel-tank filler cap.



Inspect the fuel system for leaks. The filler cap should seat well on the tank, and the fuel and pressure lines should be free of holes and cracks. Slightly stretching or bending the fuel line can reveal an imperfection or a slit that may affect operation.

HOW TO DIAGNOSE DRIVE-TRAIN WOES

If you've established that there's a problem somewhere in the drive train, follow a process of elimination to identify its source. Start at the wheels and work your way through the drive system until you reach the clutch bell; you're certain to find the source of the problem. Disconnect drive shafts or belts as you work your way along. If you remove a 4WD touring car's side belt or center shaft, for example, you'll find it easier to determine whether there's binding in the front or the rear of the drive train. Popping a drive shaft on one side of the car will help you to determine whether the problem is on the left or the right. Why is this gradual process of elimination so important to reach the source of the problem? Those with less experience may find the cause of drive-train binding difficult to isolate. Binding accelerates clutch wear and increases engine temperature; it may even blow your glow plugs. You may chase mixture settings and go through a lot of glow plugs without getting to the source of the problem, which may be as simple as a sticky brake pad or a tight gear mesh.

TECH Q&A

Q I've been told that I shouldn't use McCoy plugs in my O.S. VZ-B engine because O.S. plugs are short and McCoy plugs are long. I've also heard that you can use these plugs if you put a shim under them. Is any of this correct?

A McCoy plugs are about one thread longer than O.S. plugs (as are many other plugs). Technically, you should use a plug of the proper length, but don't split hairs. Installing a typical plug in an O.S. engine will just nudge the compression upward a little bit, and that will only cause a problem if

you have a very high-strung engine. The VZ-B is very powerful, but it isn't so tweaked that you need to worry about shimming the glow plug. Installing a second copper gasket is what most uptight racers do to compensate for installing a slightly longer plug in an O.S. engine.

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RADIO CONTROL CAR ACTION (USPS 001-087; ISSN 0886-1609) is published monthly by Air Age Inc., 100 East Ridge, Ridgefield, CT 06877-4606 USA. Copyright 2003, all rights reserved. Periodicals postage permit paid at Ridgefield, CT, and additional offices. Canadian Post Publications Mail Agreement no. 40008153.

SUBSCRIPTIONS AND BACK ISSUES: U.S.: call (800) 877-5169; Canada and elsewhere: call (815) 734-1243; fax (815) 734-5879, or go to www.rccaraction.com. U.S.: \$27.95 (1 yr.); Canada: \$39.95, including GST (1 yr.); elsewhere: \$49.95 (1 yr.). All international orders must be prepaid in U.S. funds; Visa, MC, Discover and AmEx accepted.

EDITORIAL: send correspondence to Editors, *Radio Control Car Action*, 100 East Ridge, Ridgefield, CT 06877-4606 USA. Email: rcca@airage.com. We welcome all editorial submissions, but assume no responsibility for loss/damage of unsolicited material. To authors, photographers and people featured in this magazine: all materials published in *Radio Control Car Action* become the exclusive property of Air Age Inc., unless prior arrangement is made in writing with the publisher.

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WANT TO SEE YOUR CAR IN THE MAG? HERE'S HOW.

Along with "Which truck should I buy?" and "What's a good mod motor for my Stampede," one of the questions we're most often asked is, "Why didn't my car or truck make it into 'Readers' Rides'?" The answer is simple: your pictures stunk. That's why we like to give you a few photo pointers every so often; you get a better shot at making the mag, and we get better pics to put in it. And what better way to learn than by seeing what NOT to do?*



The jungle look just doesn't cut it. The grass makes the truck look small and just looks bad. If you just gotta shoot on grass, it should be short. AstroTurf short.



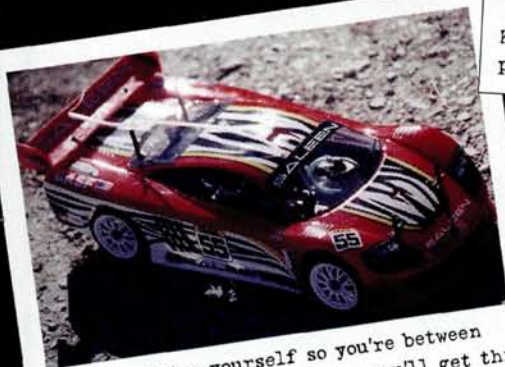
Don't forget the golden rule of "Readers' Rides": the car should look good! Who painted this thing--Ray Charles?



Gee, we can't wait to see the baby T-Maxx when it hatches! If you're going for a "Look how much suspension I have" shot, try to pick an obstacle that doesn't look like an egg.



Know what we like to see in a picture of your truck? The body.



Always position yourself so you're between the car and the sun. Otherwise, you'll get this shadowy look.

*If that's your car or truck in the "hall of shame", don't feel bad; you're getting an RC Car Action T-shirt and decals!



Aunt Sue, lean back a little. Aunt Kay, keep that cigarette in there. Uncle Bill, get your head out of the picture but leave your huge stomach in the shot. OK; hold it, "Click!"

DONE RIGHT!



Here's an example of a top-quality shot: good-looking paint, uniform lighting, nice setting ... that's what we wanna see. Jorge Gomes sent us this pic of his HPI Micro RS4 all the way from Brazil.



Don't just plunk your car on the ground and shoot a Godzilla view. Get down low and close to make your car look big and more "real."

PHOTO CONTEST

This contest is easy. All we want are pictures that confirm you spent an entire race day wearing a complete clown suit, including makeup and red nose. We want to see you setting up your pit table, signing up to race, wrenching between heats, racing on the drivers' stand, and corner marshalling. Now, readers, if some guy in a clown suit asks you to take his picture at the track, agree on the condition that he stays in the getup all day. Don't help him cheat! After all, the winner will get a Team Losi Triple-X4 Graphite!

The rules

- 1 We need your pics by February 28, so hopefully, you've got a warm clown suit. Funniest pictures win.
- 2 If you want to send digital pics, make 'em 300dpi (or higher) JPEGs, and email them to backlot@airage.com. If you have prints or slides, send them to the address at the top of the page.
- 3 No matter how you send your pictures, make sure you include your name, address, and phone number.